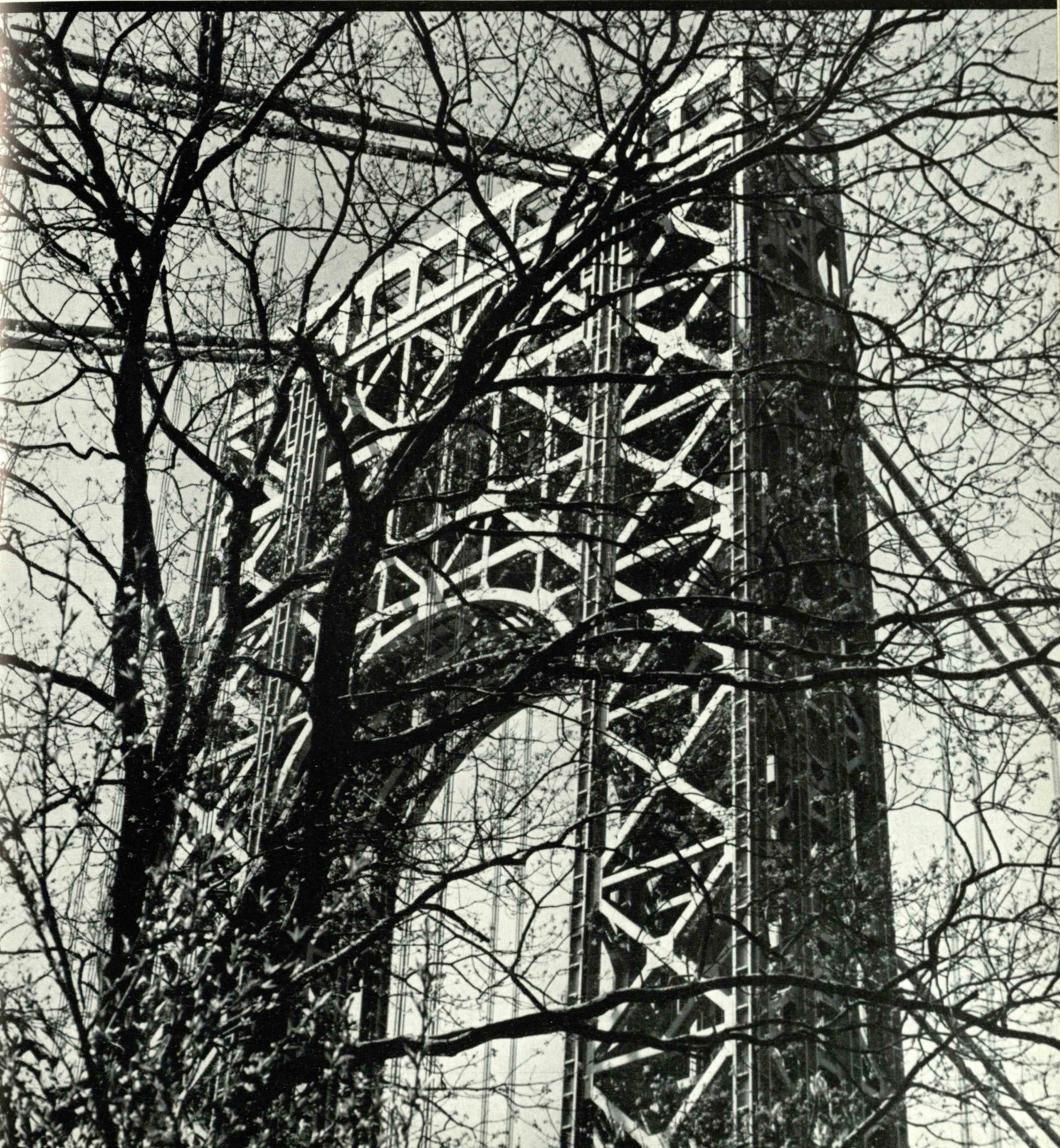


*April* 1938

# TECHNOLOGY REVIEW

Title Reg. in U. S. Pat. Office





# technology review

Published by MIT

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*Look this way*  
for MORE  
PLEASURE



*Three things that add up  
to more smoking pleasure...*

Chesterfield's refreshing mildness...  
good taste... and appetizing aroma

*They Satisfy*  
..millions

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## THE TABULAR VIEW

**A**N officer of a midwestern university recently wrote: "I should like to take this opportunity to express my appreciation for your splendid alumni publication, *The Technology Review*. I never miss an issue. The excellent format and photographs are most unusual. I trust that someday you may find it possible to increase the scope of the publication to include all current progress in technology, and release it for the general public. There is a distinct need for a well-edited magazine in this field." The Review agrees that there is need in this country for a more comprehensive magazine dealing with science and technology, and it has been gradually widening its editorial scope in an effort to fulfill this need and, at the same time, to stick to its first objective of serving the Institute and its Alumni. This issue may be taken as an example of how *The Review* is now performing this double function. Significant, too, is the fact that 17 per cent of *The Review's* circulation goes to non-Technology readers. If there are other fields which readers feel *The Review* should cover, they are invited to make suggestions.

**S**INCE joining *The Review* Staff in 1936 Professor PHILIP M. MORSE has contributed such important articles as "The Solid Matter Mystery," "Signals From the Great Outside," "Philosophers' Stone: 1936 Model," and "Yardsticks for Infinity." In this issue (page 265) he brings us up to date on some of the recent advances in the earth sciences. **¶** MARTIN J. BUEGER, '24, is an associate professor of mineralogy and petrography at the Institute. On the MacMillan expedition to Baffin Island last summer, about which he writes in this issue (page 268), he was chief mineralogist and geologist. **¶** CECIL G. DUNN, '30, is an instructor in Technology's Department of Biology and Public Health. For a number of years he has been conducting research on disinfectants and germicides. His article on page 271 is an outgrowth of this work. **¶** Professor TENNEY L. DAVIS, '13, is a regular contributor to *The Review*, covering mainly the history of science and chemistry (page 273). **¶** HARRY M. GOODWIN, '90, is dean of Technology's Graduate School, and his friendship with George Ellery Hale, '90, dated back to their student days together (page 277). In 1926 Dr. Hale dedicated his book, "Beyond the Milky Way," to Dr. Goodwin.

**I**T has been a long time since we have had the pleasure of electing a new member to our Cover Club — the group of amateur photographers who have had photographs reproduced on *The Review's* cover. This month, with vernal enthusiasm the Club renews its membership solicitations and receives a new member of unmistakable gifts — GEORGE A. MAKAROFF, '26, who discovered the entirely fresh view of the George Washington Bridge shown on our jacket this issue. **¶** Are there not other amateurs bearing prints — tickets of admission to the Cover Club's arcana?

No. 6

*Just for Fun!*

## A CHALLENGE TO YOUR INGENUITY

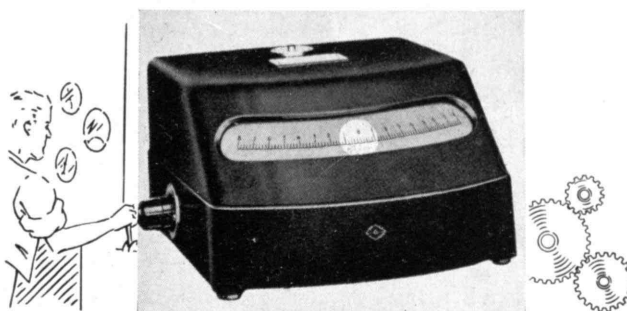
**H**AVE you ever considered just how an electric light must be wired so that it can be switched on and off from several different places independently? The commonly used circuit for this purpose may *seem* obvious when you know it, but its design presents a fascinating problem to the uninitiated.

If you are already familiar with the standard circuit, you can get an idea of the difficulties involved by trying to design an entirely different four station circuit. (The problem can be solved.)

We specialize in solving problems in mechanical and electrical design. Tell us about *your* difficulties, and let us send you information on "Guaranteed Research."

**CALIBRON PRODUCTS, INC.**

West Orange, New Jersey



## THE SPOT GALVANOMETER

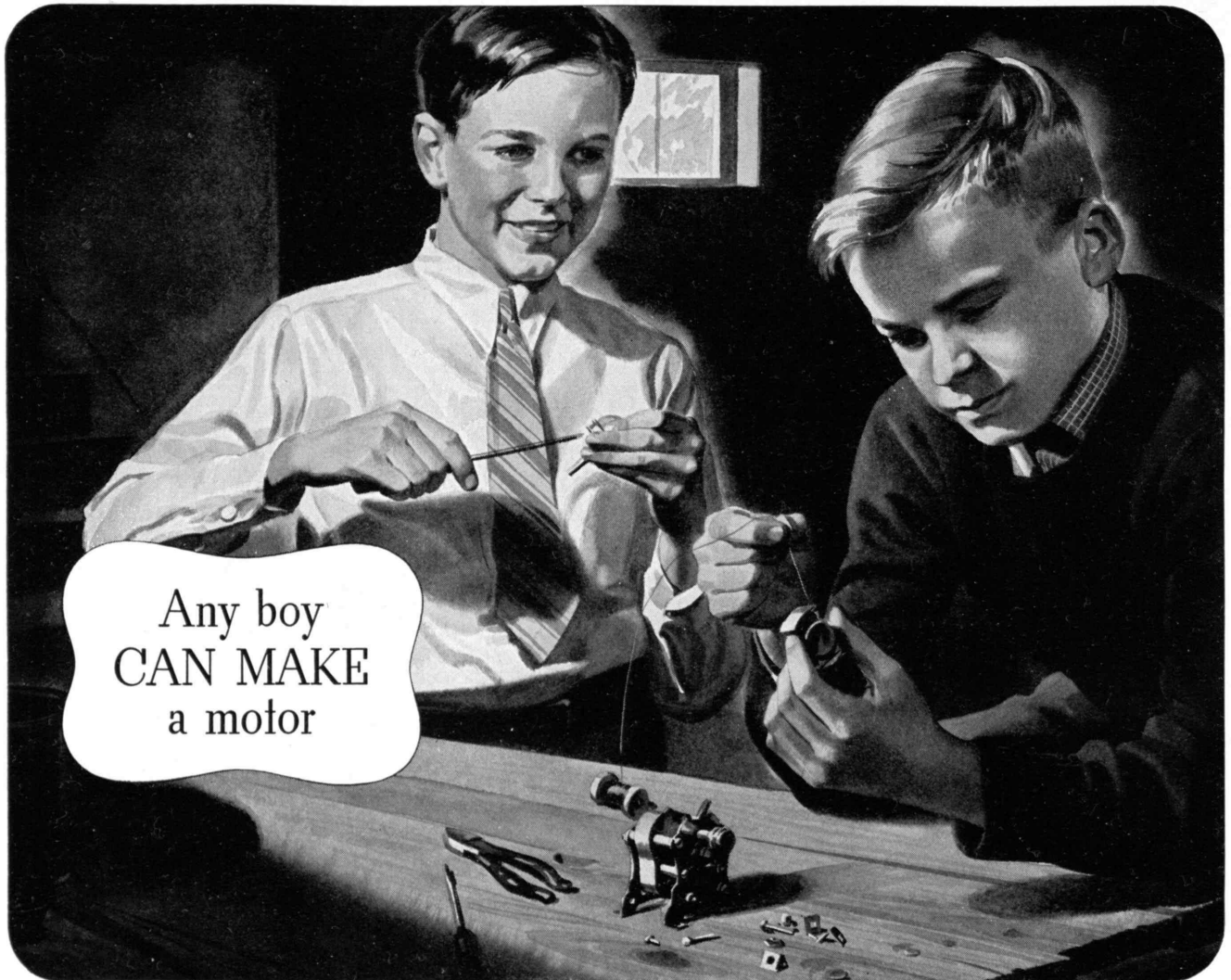
*Laboratory Accuracy... Shop Ruggedness*

The Cambridge Spot Galvanometer provides a complete outfit — galvanometer, lamp and scale — in one self-contained metal case. It is robust, has a stable zero and does not require accurate levelling. The sharply defined spot can easily be read at a distance. The lamp may be operated on A.C. service current or 4-volt battery. Sensitivity in mm. on scale is from 19 to 170 per micro-ampere using coils of 10, 40 and 700 ohms. Scale can be read to 0.2 mm.

**CAMBRIDGE**  
**INSTRUMENT CO INC**

3732 Grand Central Terminal, New York City





Any boy  
CAN MAKE  
a motor

*Fitting them to the world's work is a man-size job*

FOR a thing so important to modern life, an electric motor is an amazingly simple device. Just a few pieces of steel and iron, wound with coils of wire. Any bright boy can follow instructions and make one that will run.

Yet the most romantic story ever told could be written about the electric motor. It runs practically every mechanical device in use today. It turns the wheels of industry

— carries people to work from the suburbs to the topmost floors of tall buildings. The daily lives — even the livelihood — of most of us depend in some way upon it.

The job of fitting electric motors to the world's work is an exacting one. What makes it complicated is that every task, to be done efficiently, requires a certain kind of motor. Westinghouse, for example, offers over 20,000 different types, sizes

and ratings. If none of these is exactly what is needed, a special model will be built to order.

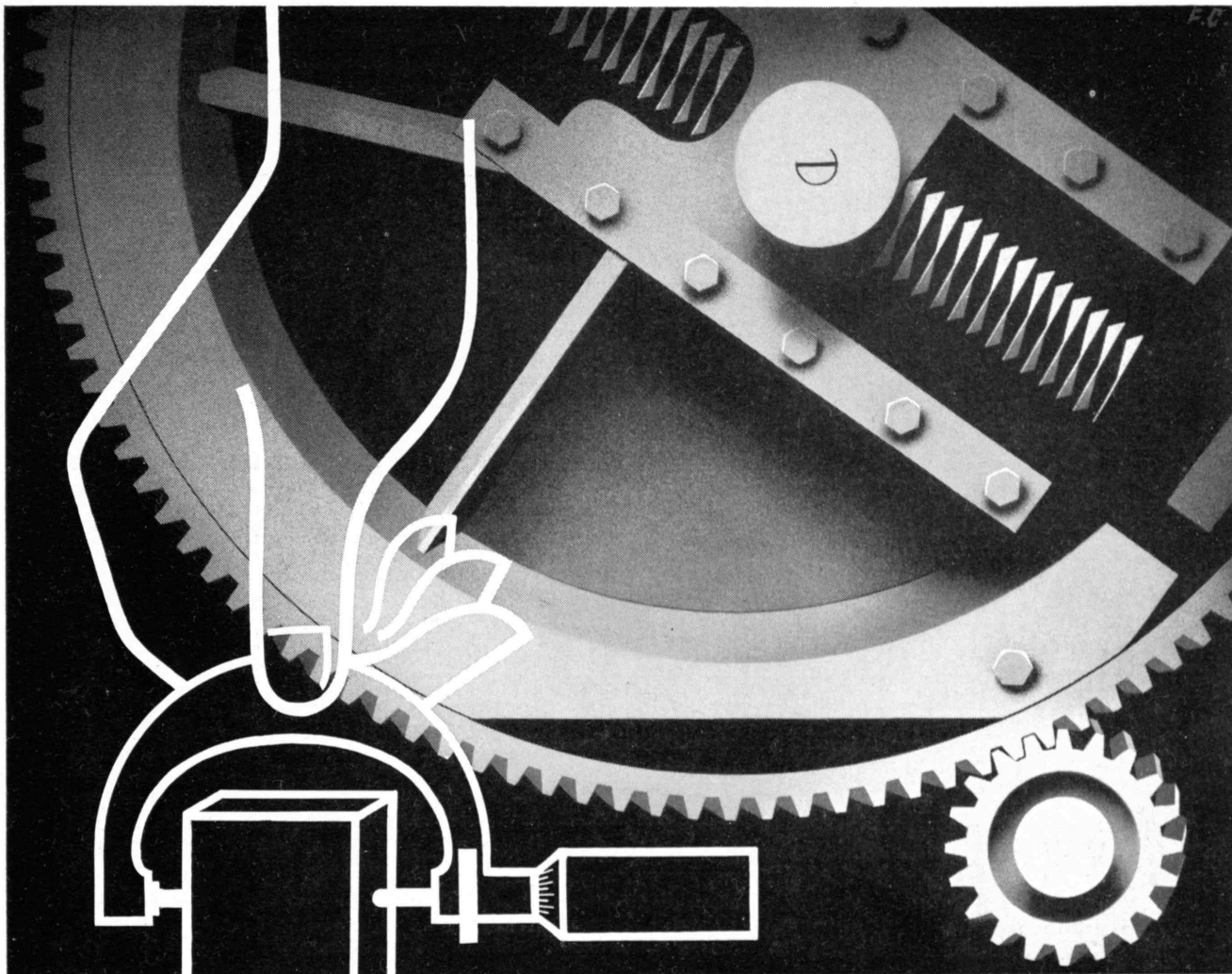
The electric motor is "bread and butter" to Westinghouse — and to just about everyone else. Fully conscious of its responsibility, Westinghouse research continues each year to seek improvement in motor design — so that the world's work may be done better, faster, and at less cost.



# Westinghouse

*The name that means everything in electricity*





## PRECISION

IT TAKES a precise machine to turn out precise work. And if its vital parts are made of Moly irons or steels, the longer maintenance of its precision is assured. Shapers, for instance.

One company building such machines uses 0.50% Mo, Nickel-Moly iron for main and intermediary gears in the power transmission system. This iron is used because *it possesses the wear resistance which preserves the close tolerances necessary to prevent "chattering."* Also—because it machines readily despite its comparatively high hardness.

Thus, the use of Moly brings advantages: (a) to the builder of the machines through simpler and more economical fabrication; (b) to the user through better performance due to longer maintained precision; (c) to the user's customers through better products.

Our technical book, "*Molybdenum in Cast Iron*," contains money-saving data. Free to engineers and production executives. Drop us a card and we will send it to you. Climax Molybdenum Company, 500 Fifth Avenue, New York City.

PRODUCERS OF FERRO-MOLYBDENUM, CALCIUM MOLYBDATE AND MOLYBDENUM TRIOXIDE

**Climax Mo-lyb-den-um Company**

**MOLY**



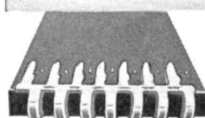


## BROWN & SHARPE CUTTERS

# ALLIGATOR

TRADE MARK REG. U.S. PAT. OFFICE

## STEEL BELT LACING



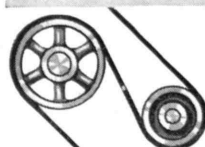
The compression grip protects belt ends.



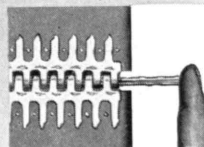
Made with precision. Drives straight.



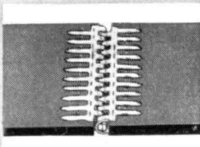
Smooth on both faces. Embeds in belt.



For all belts—all speeds. Flexible.



Rocker Hinge Pin. Separable joint.



Great strength. Long life.



Made also in "Monel Metal" and non-magnetic alloy for special service, and in long lengths for wider belts.

Sole Manufacturers  
**FLEXIBLE STEEL LACING CO.**  
4630 Lexington Street Chicago, Illinois  
In England at 135 Finsbury Pavement, London, E. C. 2



## MAIL RETURNS

### On "Rubber and Life"

FROM ERNST A. HAUSER:

There appeared in the February issue of *The Review* a contribution by George W. Gray, entitled, "Rubber and Life." This article, reporting on work done by Francis F. Lucas and A. R. Kemp who simultaneously described their research in *Industrial and Engineering Chemistry*, 30:146 ff (February, 1938), calls for a few comments.

It would be foolish to deny the perfection of the microscopic technique developed by Dr. Lucas. He is recognized as a master in this field. The ultraviolet microscope, first proposed by A. Köhler and placed on the market by the Zeiss works in Jena (Germany) and later also by the Bausch and Lomb Optical Company of Rochester, N. Y., is by no means so uncommon and unsuccessful as the author makes one believe. It has been, and still is, used with complete satisfaction in many research problems, but, moreover, it is a known equipment for particle-size and shape determination of pigments.

For illustration of this fact the reader is hereby referred to the work of Henry Green: *Industrial and Engineering Chemistry*, 16:677 (1924); *Chemical and Metallurgical Engineering*, 28:53 (1923); *Journal of the Franklin Institute*, 192:637 (1921); *ibid.*, 204:713 (1927); to the work of Haslam and Hall: *ibid.*, 209:777 (1930); *Journal of the Optical Society of America*, 24:14 (1934); and to the full description of the technique in *The Activator*, 1:33 (1935). The publication last referred to contains a photograph of the setup, which demonstrates the general identity of the instruments used in both laboratories.

It may also be of interest to the general public to know that a rubber tree will yield an average of one fluid ounce of latex per tapping, i.e., that 128 trees would give one gallon of this basic raw material. This should not mean that the gallon obtained for experiments originated from 128 trees only, but it might avoid some misunderstanding.

Dr. Lucas did not "add seven per cent of salt to 10 centimeters of distilled water," but used 10 cubic centimeters of a seven per cent salt solution. This addition does not influence the Brownian motion, as such, at all. Brownian movement results from millions of impacts, or bombardments, of the molecules of the liquid medium on the minute particles suspended therein. It depends only on the size of the particle, which must be sufficiently small to stay in suspension and to be pushed about. The addition of salt causes a neutralization of the electric charge of the latex particle. The latex particle is negatively charged, but the positive sodium ions of the salt neutralize this charge. Thus the particles lose their mutual repellency, cling to each other when they collide (aggregation, flocculation, coagulation), or adhere to the microscope slide, or cover glass, being held by so-called molecular attraction forces.

The particles have now completely changed their physical properties; they are defenseless captives at the mercy of any outside influence. When the cover glass is placed over them, it will distort them: They will flatten out, stick together, and so on. However, all this can have no bearing on the shape of a particle in its free-moving state. We have much more delicate means than the ultraviolet microscope to prove that even the smallest (ultramicroscopic) particles of older trees are, in the majority, nonspherical.

As to determination of particle size, the author states that the minimum size of a particle is currently taken to be half a micron. This is not true. Sufficient literature can be cited to prove that the existence of a considerable amount of much smaller (ultramicroscopic) particles has been recorded. Dr. Lucas' valuable contribution is the evaluation of particle-size distribution curves, but these are of interest only for bulk latex and have no significance for latices of individual trees.

The ultramicroscopic studies discussed and the preferential alignment in pearl strings cannot be considered as new discoveries (see f.e., V. Henri, *Comptes Rendus*, 144:432 [1907] and his contributions in Morisse's book, "Le Latex," [Paris, 1908]). Such studies are no more fundamental—in fact much less—than studies on other colloidal systems and colloidal phenomena, at least if one wants to draw any conclusions concerning the protoplasm and its constant changes.

Dr. Kemp's picture of the complicated structure of the tiny latex particle is an excellent confirmation, in general, of experimental results obtained some 15 years ago by dissecting (*Concluded on page 284*)



## Plastics Depend on Grinding

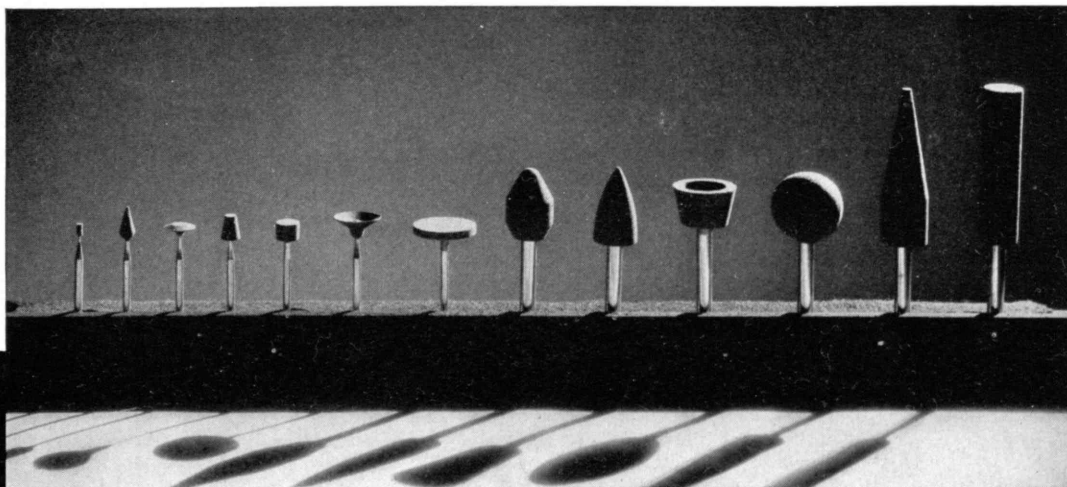
Norton surface grinders are used for a multitude of surfacing operations in the tool room of General Electric's new million dollar plastics plant at Pittsfield, Mass. Especially effective on the tool steel alloys used for these molds is the new Norton "B-E" bond wheel.

For the final finishing operations on molds, Norton Mounted Wheels and Points are used. They are made of fast-cutting 38 Alundum abrasive and are available in an almost unlimited number of sizes and shapes. A catalog showing the complete line will be sent on request.

**NORTON COMPANY**

•

**WORCESTER, MASS.**





# The ANALYZED THEIR DRIVE

**..now belts run 6 times longer!**

**H**ERE is a typical example of the economies that can result from having a difficult drive correctly analyzed and properly belted by the G.T.M. — Goodyear Technical Man.

The drive in question is on the recolor printing press in a large Texas wax paper mill — operated when installed by a conventional flat belt hook-up. Under typical paper mill conditions — moisture and overload — standard grades of belting averaged only 7 months' service and slip was a constant annoyance.

### **Saved space — and money**

A new belt every seven months runs into money, so the mill called in the G. T. M. After careful study the G. T. M. recommended that this drive be changed over to grooved pulleys for V-belt operation and in September 1934 a set of seven matched Goodyear B-128 E-C Cord Multi-V Belts was applied.

Today, 43 months later, this entire set of belts is still in operation. Not a single belt has been replaced, slip has disappeared, the press runs more evenly than ever before and the short center V-belt drive takes up much less valuable space around the press. The elimination of replacement and repair expense has repaid the cost of the change many times over.

G.T.M.-analysis of your transmission, conveyor or elevator belting problem will pay you similar dividends as thousands of records like this prove. To bring the G.T.M. to your office for a friendly talk, write Goodyear, Akron, Ohio, or Los Angeles, California — or phone the nearest Goodyear Mechanical Rubber Goods Distributor.

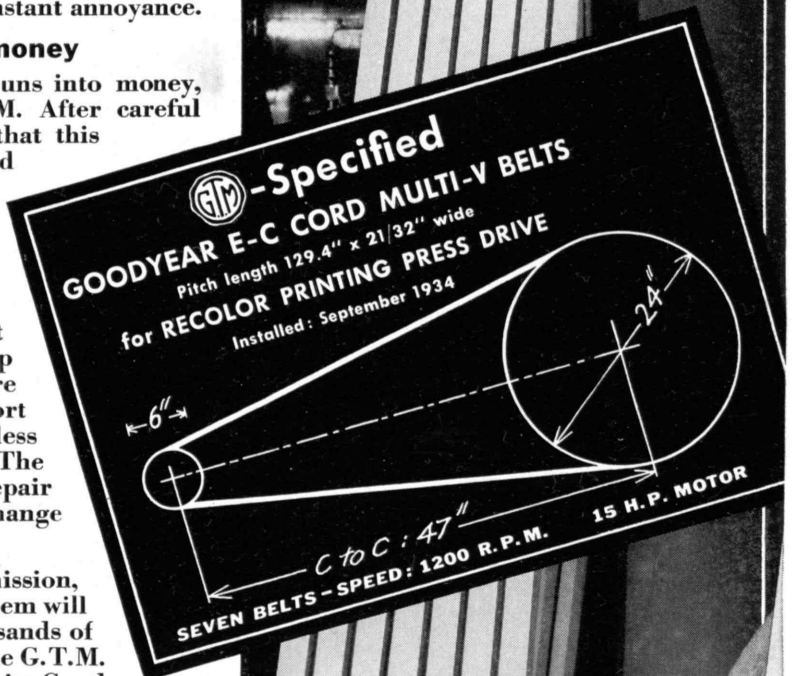
THE GREATEST NAME  IN RUBBER

# GOOD YEAR

MULTI-V



BELTS



**BELTS  
MOLDED GOODS  
HOSE  
PACKING**

Made by the makers of  
Goodyear Tires



Martin J. Buerger, '24

THIS IS A SUNDG  
 . . . an arctic display  
 caused by refraction of sun-  
 light by ice crystals in the  
 atmosphere. The sun is out  
 of the picture to the left.  
 Other names for the phe-  
 nomenon are mock sun or  
 parhelion. This photograph  
 was taken in Frobisher  
 Bay, described on page  
 268 ff.

# THE TECHNOLOGY REVIEW

Title Reg. U. S. Pat. Office

EDITED AT THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY

VOL. 40, NO. 6

C O N T E N T S

APRIL, 1938

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SPRING

*From a photograph by George A. Makaroff, '26*

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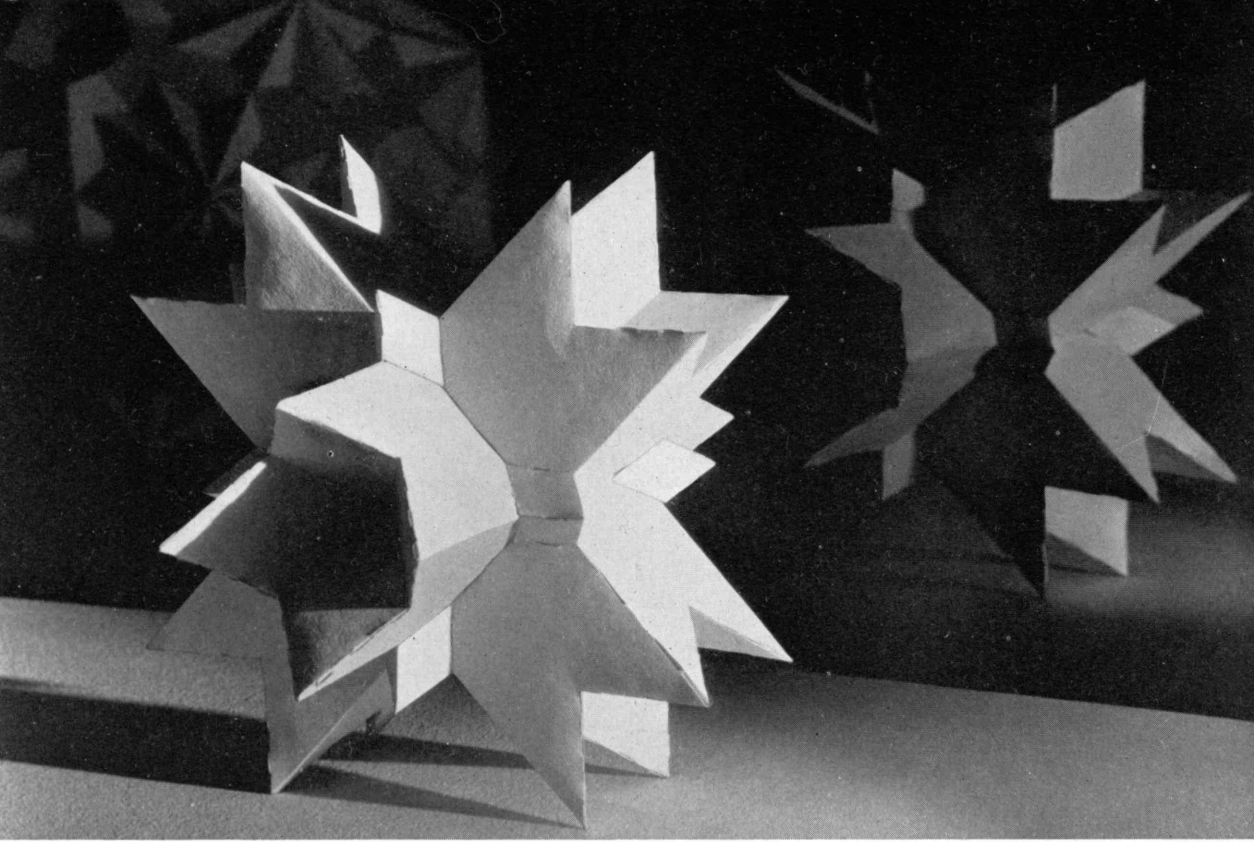
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*Left.* THE CHARMING MODEL IN THE FOREGROUND STRUTS THE DELIGHTFUL NAME, "TETRAKAIDECACHEDRON, FOURTH SPECIES," BUT NEVERTHELESS IT IS A HARMLESS LITTLE SOLID THAT PLAYS ENGAGINGLY WITH SHADES AND SHADOWS.

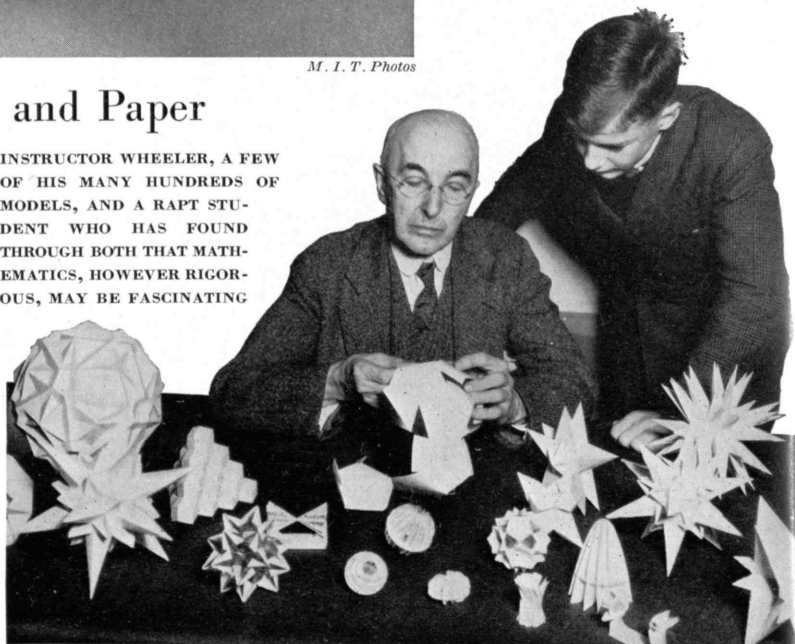
THE MODELS ARE MADE WITHOUT ADHESIVE BY AN INGENUOUS SYSTEM DEVELOPED BY MR. WHEELER OVER 20 YEARS AGO. A SELECTION OF HIS MODELS IS NOW ON EXHIBIT AT M.I.T.

M. I. T. Photos

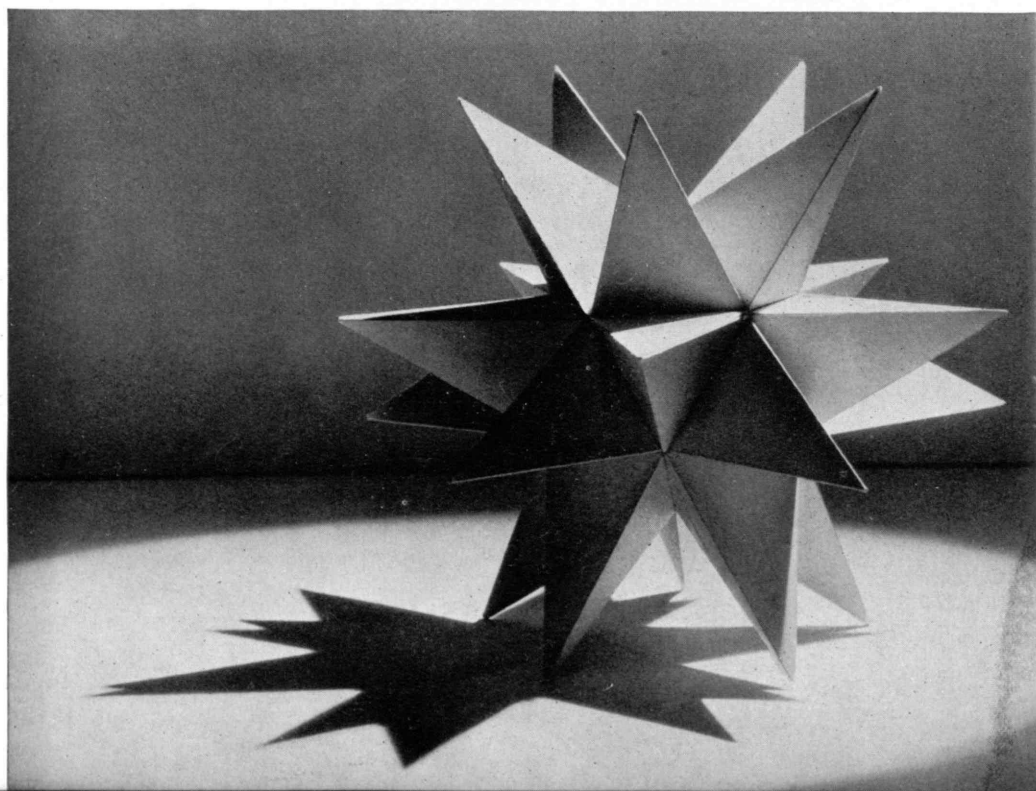
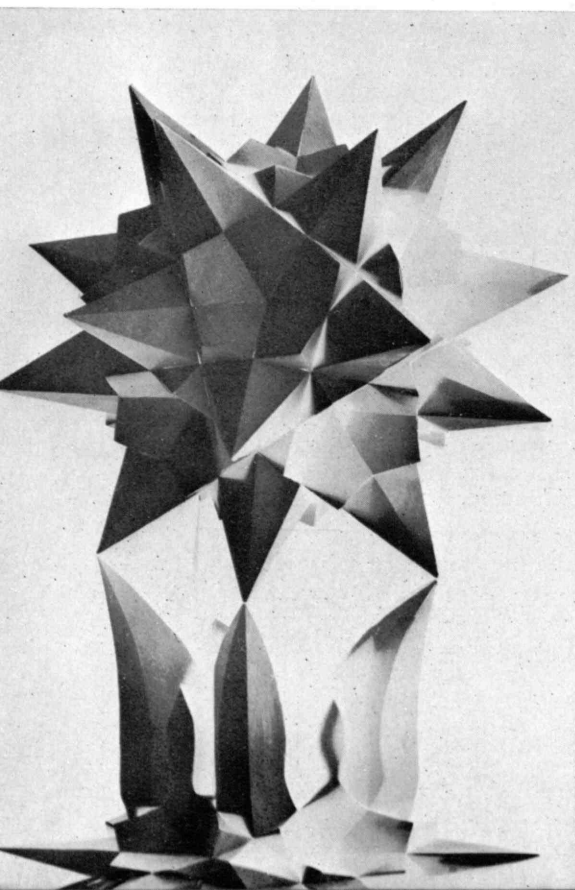
## Exploring Space with Scissors and Paper

HE opens a notebook and out pops a mathematical model. He pulls a disassembled one out of his pocket and challenges you to turn it into a full-blown model. He teaches mathematics in North High School in Worcester, Mass., and his young students find themselves having fun and gaining insight into the complexities of solid geometry by making paper models of such solids as rhombic trapezoidal dodecahedrons (*opposite page, left*) and icosahedrons (*opposite page, right*). His name is A. Harry Wheeler, and his hobby of "paper engineering," samples of which are shown adjacently, has prompted requests for exhibits from colleges and mathematical societies and supplied him with a teaching tool that helps flat young minds to expand into the third dimension and to perceive the beauties of geometrical form.

INSTRUCTOR WHEELER, A FEW OF HIS MANY HUNDREDS OF MODELS, AND A RAPT STUDENT WHO HAS FOUND THROUGH BOTH THAT MATHEMATICS, HOWEVER RIGOROUS, MAY BE FASCINATING



*Left.* ICOSAHEDRON  
*Below.* A PENTAGONAL DODECAHEDRON



# THE TECHNOLOGY REVIEW

Vol. 40, No. 6



April, 1938

## The Trend of Affairs

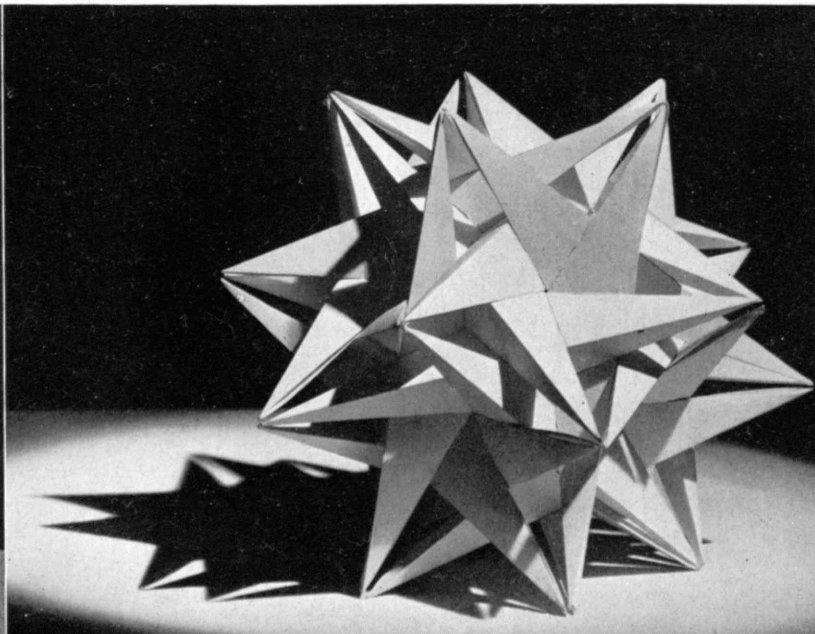
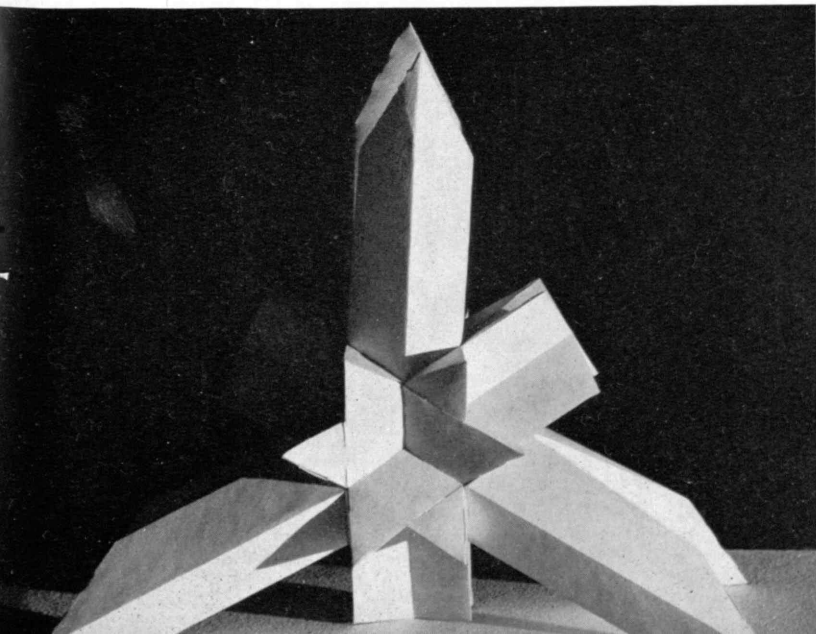
### *Footnotes to Our Life Expectancy Table*

**M**AN'S paradoxical nature is neatly illustrated in the fact that as he improves his chances for long life, equally does he increase his ability to shorten life either through accident or through design. And all the time, among his greatest interests are the questions not only of how he may increase the length of his stay in this vale of tears but also of how he may predict his chances.

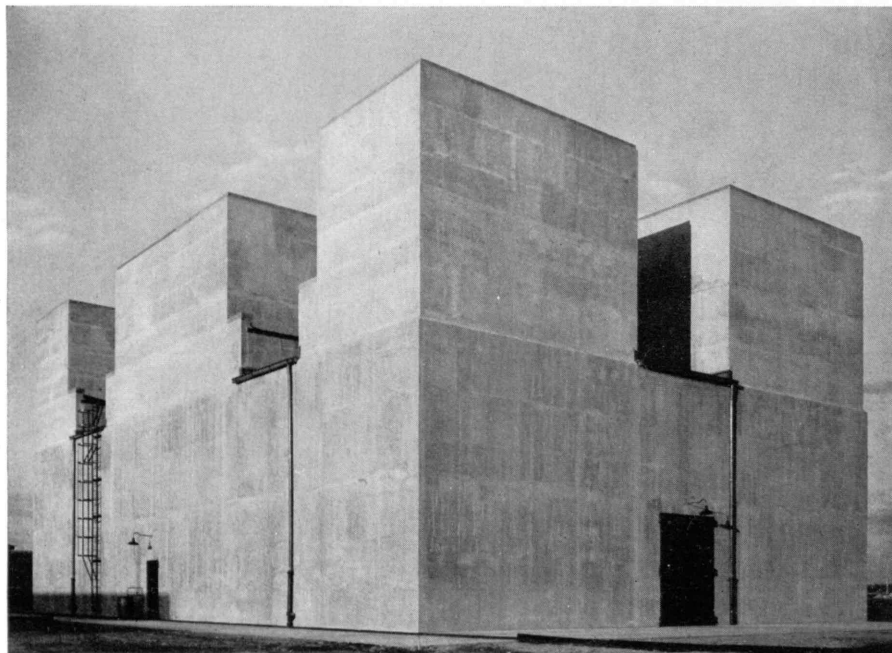
Indication of a partial answer to the first question sometime in the future is contained in reports from Brown University investigators who have nearly doubled the life span of water fleas through regulated feeding. If the water flea is given a limited food supply when young and a normal diet after maturity, its vigor, growth, and reproductive life are increased from the normal span of 29 days to from 42 to 51 days. Corroboration for the popular belief in the desirability of a frugal, even Spartan, youth for mankind may be had from these experiments, according to Professor Arthur M. Banta, who said that the results of these studies may

possibly point the way to longer life for man. "Persons who lead very frugal lives until past middle age, and then have generous living, may be expected to live longest," he said. Associated with him in the study are Dr. Lester Ingle and Howard Dunham.

The second question — that of anticipating the bad news — has also received partial answer lately: Dr. Raymond Pearl of Johns Hopkins announced that study of the relation of biological constitution to human longevity makes possible the classification of long-lived and short-lived among people who will die of diseases of the heart or blood vessels. Medical, anthropometric, and genetic constitutional examinations, made when the persons are in a state of health, make differentiation possible long before the onset of the diseases which will ultimately be fatal, he said. Other results of Dr. Pearl's study, slightly dismaying to the Epicurean element, are his statements that "smoking is associated with a definite impairment of longevity," which even with moderate smokers is sufficient to be measurable and significant; that moderate use of alcoholic beverages gives no measurable effect on longevity, though heavy





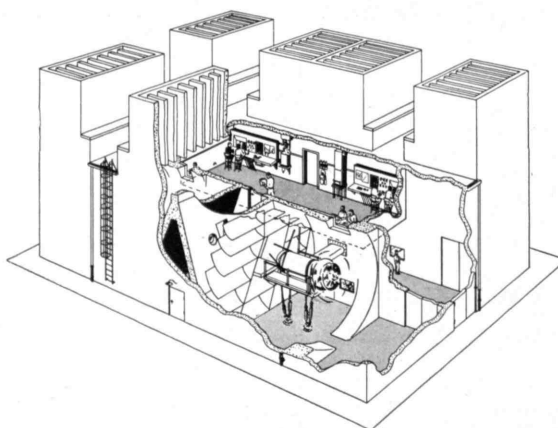


#### POWER PALACE

Four airplane engines of up to 3,000 horsepower each, can be accommodated in this spectacular new test house built by Pratt and Whitney Aircraft in East Hartford, Conn.

The test chambers, one of which is shown below, are large enough to swing the great 23-foot propellers required by 3,000-horsepower engines.

To reduce noise, a new type of sound-absorbing acoustic material, known as Calistone, is suspended in parallel rows within the intake and exhaust stacks



indulgence "definitely and considerably impairs life expectation"; and that hard physical labor, whether indoors or outdoors, has no effect on expectation up to about 40 years, after which it results in definite impairment.

#### On the Record and Off Again

MUSIC lovers who satisfy their urge with phonograph records have complained, without much effect, of the short life of commercial pressings. A full symphony of ten records represents a considerable investment, but after five playings the first flower of the tone quality is gone, and after 25 playings the needle hiss increases in prominence. One hundred performances are sufficient to depreciate the investment completely. In the popular-music field, short life is not serious, since rapidly moving fashion renders most records obsolete before they are played 50 times. But classical records could remain a joy — if not forever, at least for a good many years — were it not for the wear and tear to which they are subjected by the reproducing equipment.

The principal cause of wear is the high pressure with which the needle point bears on the bottom and sides of the record groove. The weight of the reproducer ordinarily is from two to three ounces. When this force is transmitted to the record through the sharp point of the needle, the pressure on the record itself is many tons per square inch, so close to the elastic limit of the plastic record material that serious wear occurs in a very short time. The answer to the problem has been obvious for some time: Reduce the weight of the reproducer assembly. But if the weight is reduced, the needle will not track properly in the groove. Faithful tracking at reduced pressure is possible only when the needle suspension is very delicately balanced. And delicate balance makes an expensive and fragile instrument.

Now comes word that two members of the research staff of Cruft Laboratory at Harvard — F. V. Hunt and J. A. Pierce — have developed a suspension which is delicate, electrically and acoustically, but sturdy mechanically. The needle itself is a finely shaped sapphire and requires no replacement. It is mounted at the apex of a small cone of aluminum, through the sides of which two thin phosphor



bronze strips pass. These strips are attached to the arm of the reproducer assembly in such way that they pass through uniform magnetic fields of opposite polarity supplied by permanent magnets attached to the end of the arm. When the sapphire needle is moved side-wise in its passage along the groove on the record, one bronze strip moves down through the magnetic field while the other moves up. Consequently an electric current whose strength is proportional to the amplitude of the needle motion is magnetically induced in the strips. This current is extremely small, but its strength can readily be increased by vacuum tube amplification. In fact the new reproducer has about the same power output as a high-quality, broadcast-station type microphone and can be amplified by the same equipment. The conventional reproducer obtains a much higher voltage output, necessitating less amplification, but at the expense of a massive and stiffly mounted needle suspension. By throwing away power output, readily made up by amplification, Hunt and Pierce have gained an extremely lightweight suspension. The results: perfect tracking at five grams (0.17 ounce), and one hundred playings of commercial records without any observable wear.

The reproducer was developed primarily for the valuable records made during the Harvard Tercentenary Celebration. When its electrical characteristics were tested, to everyone's surprise they were found to be as much of an improvement as were the mechanical ones. The instrument was found capable of reproducing any note from four octaves below middle C to six octaves above middle C, without discrimination (in technical parlance, frequency response variation less than three decibels from 30 to 18,000 cycles per second). The upper extremes of this vast range have little value except in reproducing the highest upper partials (overtones) of such instruments as the tambourin. The reproducer is in fact capable of handling more quality than can at present be put on a record; so it will be valuable not only for preserving present-day records, but for the improved records of the future.

### *Squealing for Profit*

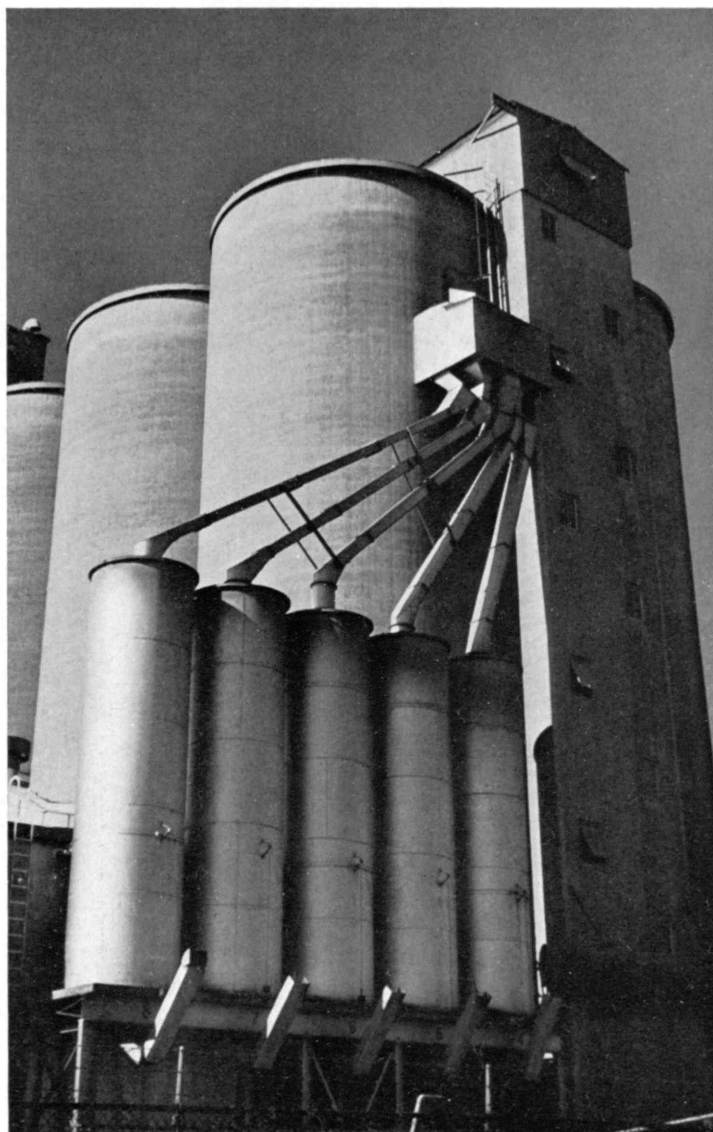
**T**O the standard method of liquefying the almost ideal gases — which consists essentially of compressing the gas, cooling it to a convenient temperature, and then allowing a sudden expansion to cause a further drop in temperature — has been added a whistle.

The squeal, placed in the expansion valve by Chester W. Rice of the General Electric Company, converts some of the heat energy into sound energy, and thus causes a somewhat greater fall in temperature than would otherwise be the case. Conversion of heat into sound energy is greatest at a definite pitch, and, as would be expected, the sound must be allowed to escape easily from the liquefying chamber in order to achieve maximum efficiency.

### *The Myth of the Bursting Wall*

**B**EGINNING perhaps three years ago, vague and disquieting rumors began to be heard in the building industry. According to unsubstantiated reports, there had been some fearsome goings on during this and that winter in this and that cold spot. Old barns in Canada which had stood their ground stanchly through the centuries needed only, it appeared, to have their wall spaces stuffed with insulation in order to burst their seams. One worried house owner, the stories went on to tell, had spent one Sunday excavating near the sill of his house and had come up with a solid chunk of mineral wool and ice.

Largely associated as these tales were with insulations of the fill type and no doubt given a push here and there by ambitious salesmen for other types of insulation, these rumors soon flew from the mouths of those who had a professional interest in their truth to the



ACCENT ON FUNCTIONALISM

*In Albany, N.Y., stands this mammoth and handsome grain elevator*

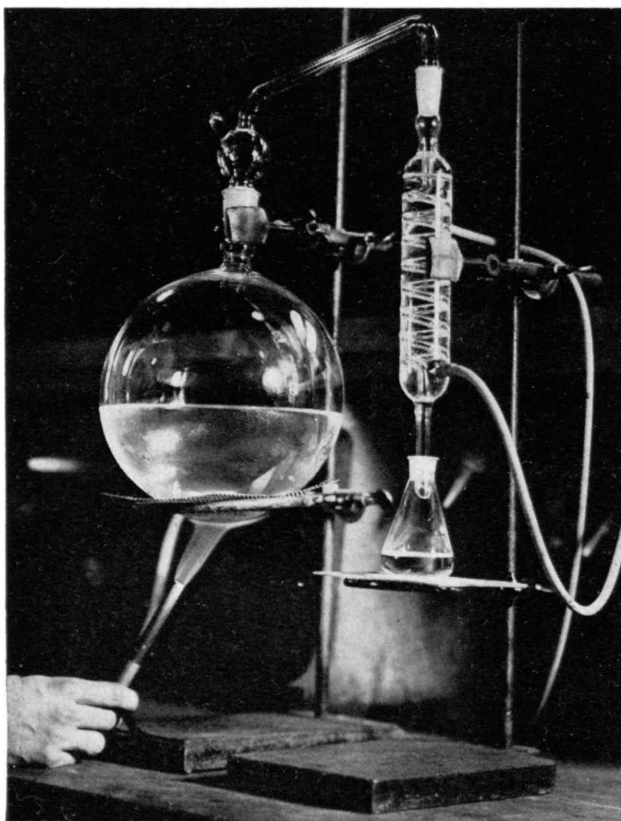
*Cushing*



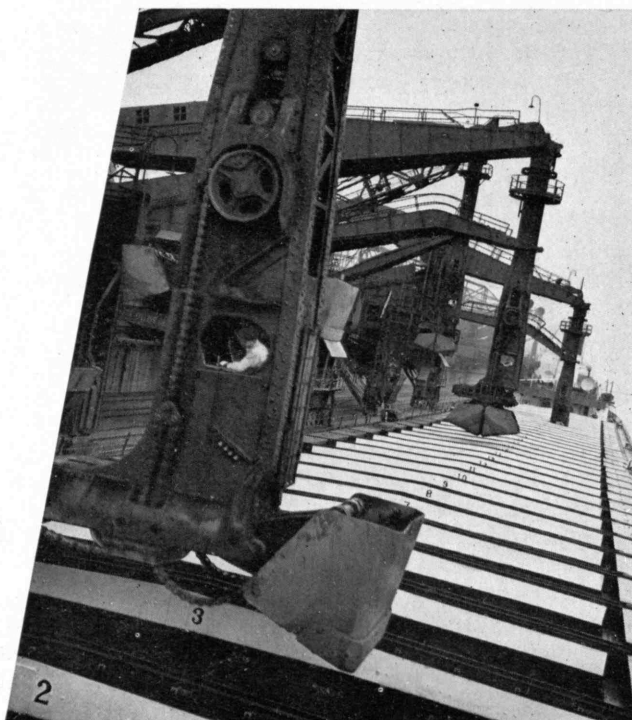
consuming public. As a result of all this talk, the house owner of this spring is quite acutely conscious of condensation—a phenomenon which has not bothered him before. Professionals have been worried about it longer. As early as last October the Forest Products Laboratory published a preliminary report on the matter and, even before that, a joint project of the University of Minnesota and the National Rock Wool and Slag Wool Association, under the guidance of Professor Frank B. Rowley, had begun to study the same problem. The Rowley report, recently off the press, though somewhat more scientific in its terminology and though based on a different type of study, confirms in every essential detail the earlier report of L. V. Teesdale, senior engineer of the Forest Products organization.

Neither pays any attention to the mythical bursting barn, though it is clear that both think that under sufficiently strenuous conditions such a debacle might have taken place. Both are at some pains to make clear that trouble with water in wall or roof spaces is not unique to fill types of insulation. Both have the same conception of the cure. Both are reassuring, except to the quizzical, when they point out in almost identical words that “the problem is not to be feared after it is once understood.”

Condensation itself is, of course, no new thing. It might have been found at any time in a cold climate in any building whose interior was at reasonably high humidities. The cases in which it occurred in days past were sufficiently rare so that engineering might accept it as a necessary evil and exercise special precautions for drainage or other elimination. Condensation, as



Ellis O. Htnsey



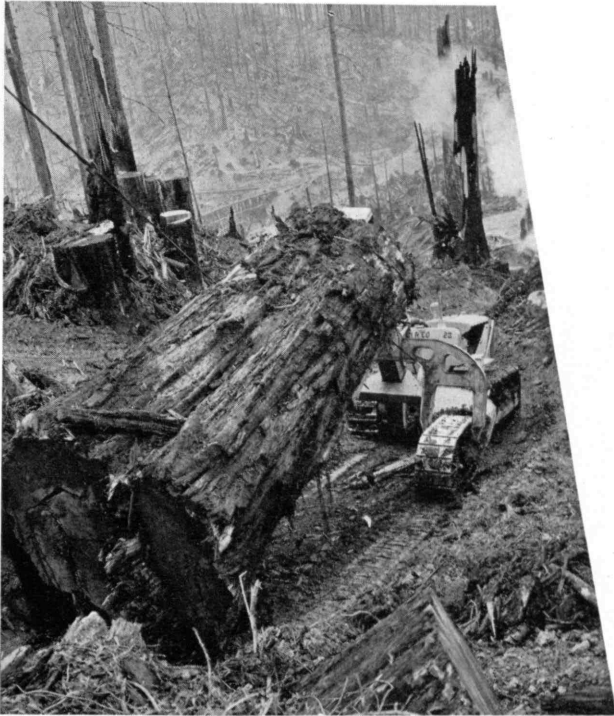
Korth

#### UNLOADING

... iron ore boats at the Gary works of the Carnegie-Illinois Steel Corporation

surely every reader of The Review will recall, is the sort of thing which happens on the ice pitcher on a humid day in the summer. It is caused by water vapor coming in contact with a surface, the temperature of which is below the dew point for the water vapor in question. When that happens on an ice pitcher, we get drops of water. When it happens on the inside surface of sheathing, we get similar drops of water, although we do not see them. If the sheathing is below freezing temperature, ice may actually be formed. Even if it is not and even if we do not see the water which is being deposited, that water may do damage to the frame, the boarding, or even to the insulation. It is just as well not to have it.

Three almost simultaneous developments in house-building technique have now made the problem one which faces every builder. In the first place, weather stripping and other methods of making the building tighter have also tended to build up the difference in vapor pressure between the inside and the outside of the house. This makes the water vapor more anxious to escape through the wall diaphragms. Secondly, there has been an unquestioned tendency actually to increase the humidity, and therefore the vapor pressure, in the house by artificial means. A considerable battle is being waged at this very moment as to what degree of humidity is desirable. Whatever physiologists ultimately decide, we still have the increase today. Finally, the increased use of insulation has made warmer that part of the wall which is inside the insulation but, conversely, has made colder that part of the wall outside the insulation. This has had the effect of actually moving the dew point for any given vapor pressure closer to the inside of the house; with any real degree of insulation and with cold weather outside, the dew point will generally be well inside the sheathing.



## HANDLING

... huge redwood logs such as this is now simplified by a "cruiser," shown above

Now, if the vapor pressure of the inside seeking to get out can penetrate to that layer of the wall which is at dew point, precipitation will occur. Unfortunately, all too often it can. Plaster, for example, which is an excellent barrier to air infiltration, might almost as well not be there as far as stopping vapor movement is concerned. For vapor movement is independent of air movement. Consequently, there have been many instances where vapor has pushed through the plaster, through the lath, through the insulation (few insulators except perhaps aluminum foil are much good at stopping the passage of vapor) and, coming smack against that layer of air or siding or what not which is at dew point, has condensed. Then there has been trouble.

So it is entirely possible, if you own an old house and have had its walls filled with insulation and have weather-stripped your doors and windows, that the little droplets of water are holding a *Walpurgisnacht* against your siding. About the only resolution possible to such a dilemma is to bore holes in the outside wall to relieve the vapor pressure. Experiments have indicated the validity of this idea. If you saturate the insulation in an electric refrigerator, thoroughly seal the outside, but let the wet insulation breathe to the inside, you can desiccate the insulation in no time. In a house the same thing is true in reverse. As a matter of fact, recent reliable installations on old houses have provided these ventilation holes.

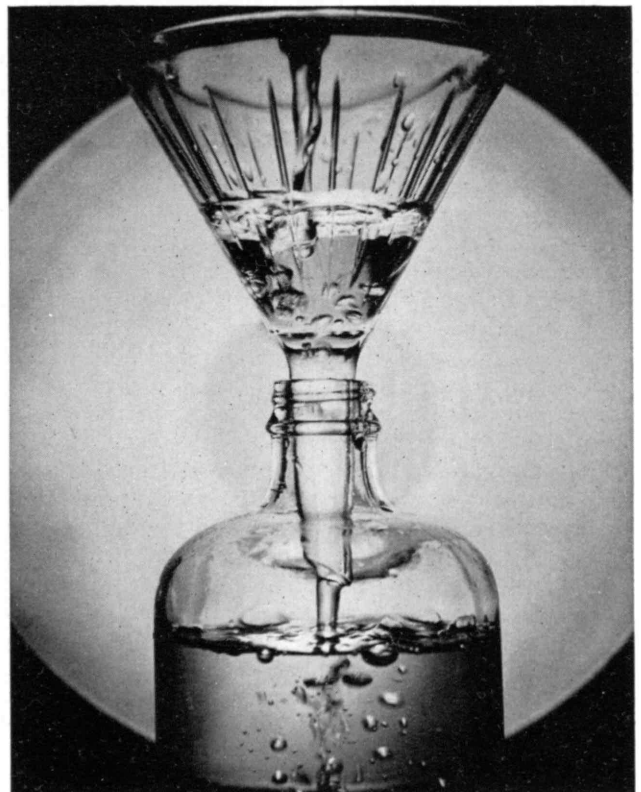
If, on the other hand, you are building a new house, the problem is much simpler. Now all you have to do is to provide a vapor seal on the warm side of the insulation. A convenient place is right back of the lath. A good many materials have been investigated as weather seals. Common ones which seem to work very well include

asphalt-impregnated and surface-coated sheathing paper, glossy surfaced; laminated sheathing paper of two or more sheets of kraft cemented together with asphalt; or double-faced reflective insulation mounted on paper. A good deal more study needs to be done in this field.

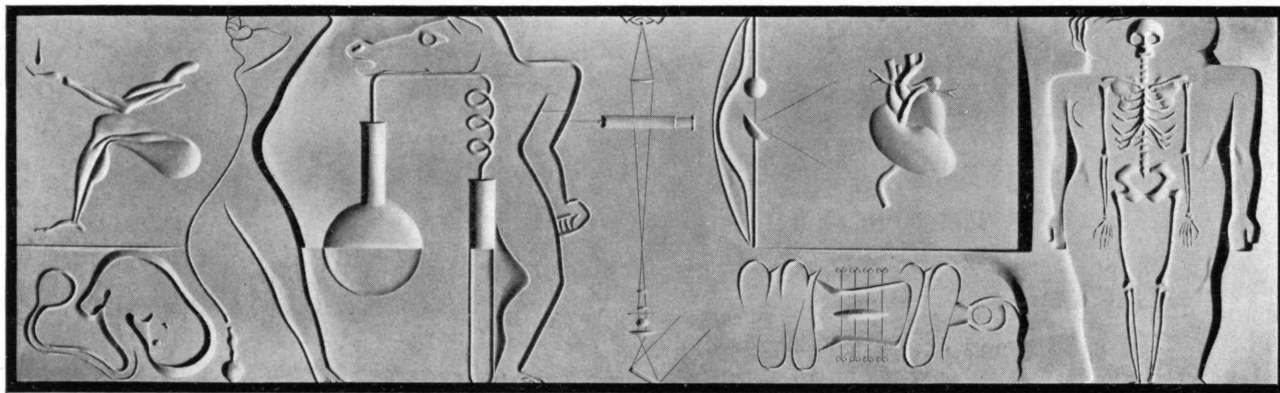
The weight of evidence indicates that this vapor seal, though it should be applied with considerable care, need not be 100 per cent perfect. This, as any practical builder will realize, is fortunate indeed, particularly in regions where platform construction is unpopular.

Since fill types of insulation were the target of most of the early attacks, this much ought to be said in their defense: There is no evidence whatsoever that many of them are hygroscopic or like to stay wet. They do not resist the passage of water vapor, but no more do other types. Since they fill the whole space, the dew-point plane may occur within them and the condensation may appear within them and their surfaces may appear wet. But equally guilty types which do not reach to the siding may not by wetness betray their culpability at all. In any event it does seem that the problem is within a stone's throw of complete solution.

But in a very few years the eager selling efforts of three quite different businesses have produced the topsy-turvy results for the house that we bore holes in the outside and put the building paper on the inside. Technological developments in equipment and in comfort will undoubtedly create even more revolutionary changes in technological needs before long. This is all very discouraging for the descendant of the pioneer who built his own house, but it is strong evidence, if any were needed, that we cannot safely tolerate much







*Design by Isamu Noguchi for frieze in medical building © F. S. Lincoln, '23*

longer the slipshod practice by which anyone who wants to put up a sign becomes a builder. If the makers of insulation, of weather stripping, and of air conditioning are capable of a scientific nap, what shall we say of the term of sleep of the fly-by-night in the building business?

### *British Weather Sets a Precedent*

ACCORDING to a recent analysis of observations made during the years 1815 to 1934 at the Radcliffe Observatory, Oxford, the English climate, never notorious for its inclemency, has lately been unprecedentedly mild. Not content with equaling in mean annual temperature the two other warm spells recorded in the 120-year period, the last 40 years have been remarkable for warmer winters and, until the last few years, for decidedly cooler summers than have previously fallen to the lot of Englishmen. As far as the two decades ending in 1934 are concerned, no other 20-year period can show a smaller difference between mean summer and mean winter temperatures. It looks as if, at least for that happy island, nature has adopted air conditioning.

### *Half-Tone Electrons*

THE engineers engaged in television research have labored long to produce an electronic "camera" tube which would transform moving optical images into a succession of electrical impulses. Last year their efforts produced tubes of such sensitivity that they can excel the human eye. The cameras employed in televising the British coronation were of this type. Since the photosensitive surfaces in the tubes are sensitive to infrared light, the camera can penetrate fog better than the eye, a fact of great convenience on the day of the coronation. In fact, because of the ability of the camera to penetrate mist, the viewers at television receivers had a better view of the proceedings than did the engineer, himself, who operated the television camera.

But these camera tubes are expensive, and the images they produce are variable in shading and contrast; so they were considered unsuitable for the prosaic but highly necessary job of testing television receivers at the factory before shipment. A new "picture" tube has been developed, one whose abilities are very restricted compared with the camera tube, but which

nevertheless is ideally suited to testing purposes. The picture tube has a very limited repertoire: It produces a fixed image — one which does not move and which cannot change from day to day.

The manner in which this image is produced is a very ingenious combination of the printing and electronic arts. Inside the tube is a flat plate of aluminum, on which has been printed, with an ordinary half-tone engraving, a reproduction of the scene or image desired. Inks for printing on aluminum have been developed at the instigation of candy-wrapper manufacturers, but the ink engineers had little idea of the use to which their new product might be put. It so happens that the secondary-electron ratio of the ink is considerably lower than the secondary-electron ratio of the aluminum on which it is printed. By this is meant that if electrons from some external source are sprayed on the plate, they will liberate other electrons from it, but the number liberated from the printed portions will be less than that liberated from the unprinted portions. Consequently, the density of the liberated electrons, as they move away from the plate, reproduces the

### PHOTOGRAPHIC DRAPERIES

*The photomural has won a place in decoration; now comes the photo-fabric, striking examples of which are shown adjacently.*

*Mrs. Leize Rose of New York uses this patented technique for reproducing any photographic subject on a variety of fabrics. She has executed huge patterns from six to 14 feet in length, and she has made small designs with repeated motifs. The designs are in soft monotone pastel shades or in deep colors. Here, indeed, is a new and flexible medium for the interior decorator*

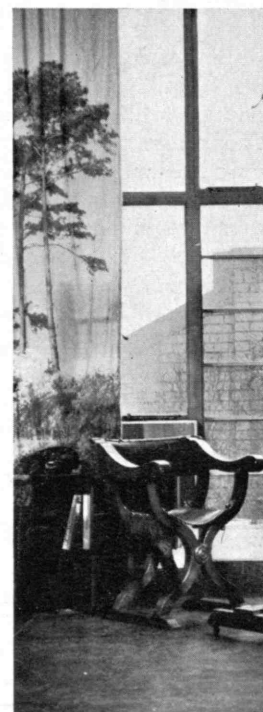


image printed on the plate. By collecting the liberated electrons in the proper sequence and conducting them to an electrical circuit outside the tube, an electrical signal, a counterpart of the optical image in the tube, is produced. Moreover the electrical signal is very "crisp," that is, it contains considerably more detailed information than that produced by a camera tube. Such a half-tone signal, produced in an inexpensive tube, having unvarying brilliance, contrast, and size, and having a fixed outline with which the factory inspector can soon become familiar, is obviously well suited to test purposes. When television receiver production gets under way, it is certain that many of the new picture tubes will be employed on assembly lines and in test booths to assure uniform quality.

### *Haldane on War*

THE discussion of how science can affect warfare in the future is usually in the hands of journalists who are bathed in ignorance, in lurid color, or in both. A judicious estimate of the trends which will probably shape future weapons is therefore a refreshing change and was recently offered before a military audience by Professor J. B. S. Haldane, already renowned for his brilliant expositions on science, not so well known for his services in the "very comfortable" trenches of Flanders.

Speaking with the authority of one who can write Captain before his name and F.R.S. (Fellow of the Royal Society) after it, Professor Haldane makes some very sensible suggestions on the military value of "grossly high-brow people," points out some technical difficulties facing gas and bacteriological warfare, and indulges in a little philosophy concerning the military mind. Admitting that the conservatism of the usual officer is probably a necessity of his profession, Haldane never-

### CANTILEVERED

*... steps, as used in this modern English house, are a pleasant though expensive tour de force*



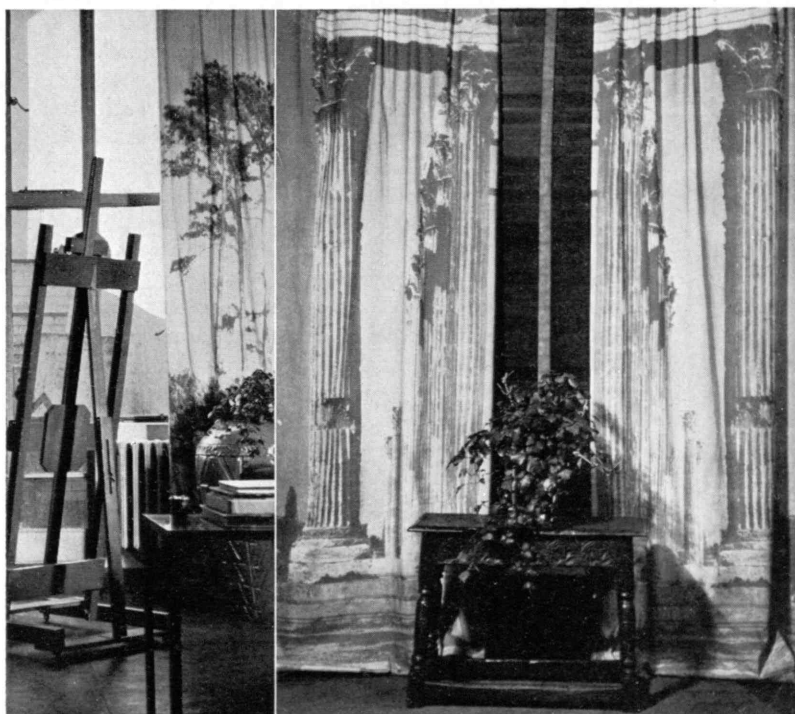
*F. S. Lincoln, '22*

theless pleads for a more liberal attitude toward the knowledge that science is accumulating in fields whose relations to war are obscured only by Napoleon's failure to mention them.

Starting with the indisputable fact that the men who win battles are those who escape wounds and resist fatigue a trifle longer than the corresponding units on the opposing side, he arrives at the somewhat unexpected conclusion that the lord high holders of the purse strings might very well divert some of the funds now being used for the improvement of gases and explosives—which for good scientific reasons probably cannot be improved much further—into an intensive study of the physiology and psychology of fatigue.

A specific problem is the determination of the fatigue elements affecting such key men as tank and truck drivers. That special conditions exist was demonstrated during the recent strike of bus drivers in London, when one complaint of the strikers was the high incidence of stomach trouble in their trade. It may be added that industry has not only recognized for long that fatigue is closely associated with productive efficiency but has also done some very drastic things about it.

Obviously, such problems cannot be solved on short notice; neither can one reasonably expect that in time of emergency some neglected genius will instantly apply a similarly neglected scientific principle to a startlingly new method of attack or defense. Haldane states that from five years to two





## In Reading this Review, Have You Discovered . . .

IF NOT SEE PAGE	IF NOT SEE PAGE
<p>... What can happen to the walls of your house if they are insulated — and how to prevent it? . . . . . 259</p> <p>... The difference between a woman's dickey and a man's dickey in Baffin Land, or how the polar bear influences fashions? . . . . . 270</p> <p>... How it has been demonstrated that a better phonograph pickup can be built? . . . . . 258</p> <p>... How a world-famous biologist recommends the next war be fought? . . . . . 263</p> <p>... That you can actually see what a rhombic trapezoidal dodecahedron is? . . . . . 256</p> <p>... How the water flea has shown the wisdom of living a Spartan youth, pointed the moral of a proper diet? . . . . . 257</p> <p>... How a new drug was discovered in the German dyestuffs industry? . . . . . 273</p>	<p>... How a squeal is used to lower temperature? . . . . . 259</p> <p>... The difference between a germicide and an antiseptic? . . . . . 271</p> <p>... Whether an ideally successful mouthwash is available? . . . . . 287</p> <p>... What Nature's most perfect timepiece is? 267</p> <p>... The geological-time clock? . . . . . 267</p> <p>... What land has risen 180 feet out of the ocean since it has been relieved of a great weight of ice? . . . . . 282</p> <p>... The photofabric, striking new medium for the interior decorator? . . . . . 262</p> <p>... What the growing science of chemotherapy is, and what it is accomplishing? . . . . . 273</p> <p>... The new picture tube which turns a half-tone into an electric current? . . . . . 262</p>

generations elapse between the discovery of a really new scientific law and its practical application to industry or war. Data in the report of the President's Committee on Technological Trends indicate an even longer lapse in the case of really fundamental inventions. Nevertheless, the possibility of military surprises in a future conflict is not ruled out, and there remain enough dreadful possibilities in techniques already being explored to create an acute need for a staff capable of tackling the unexpected. In such situations, feels Haldane, it is the academic laboratory man — the scientist rather than the technician — who makes the better showing. As the British Admiralty found out during the War, it was the grossly high-brow people, the kind who did acrostics and forgot to wear their ties, who were the only ones capable of deciphering the German naval code.

Haldane does not particularly fear innovations in the fields of high explosives and poison gases. From theoretical considerations, it is known that present powders already contain close to the maximum amount of energy which can be crammed into a given mass. Similar reasoning gives only an outside chance to the discovery of poison gases more dangerous than present ones.

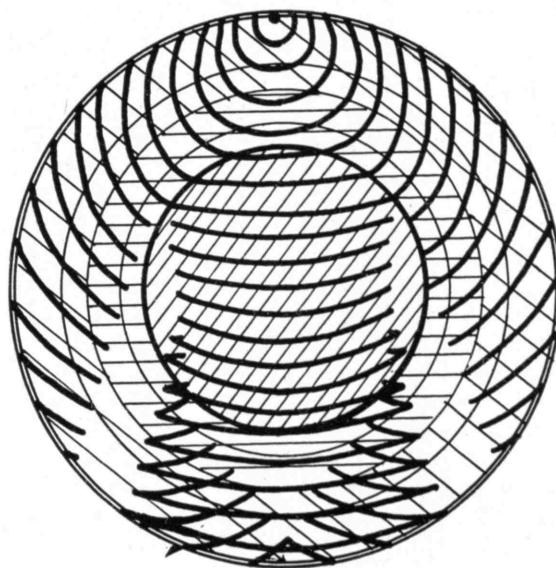
The use of living poisons, however, is another matter. However solemnly abjured by civilized nations, the only likely obstacle to the use of viruses and microorganisms in warfare will be the difficulty in dispersing them alive and in such manner that enemies and allies are not promiscuously attacked. It will be simpler, incidentally,

to drop plant pests far behind enemy lines and permit them to "bore from within" according to the best tenets of the Marxians. It would be relatively easy, for example, to drop the potato beetle into England. More disturbing to Englishmen is the suggestion that if the yellow fever mosquito ever established itself in India, the disease would become epidemic throughout the country.

If such speculations become realities, the creation of defense techniques will be no job for generals. It will be of national importance that the right expert be given the right job, and Haldane suggests that the military masterminds keep in constant touch with the scientific personnel of the country so that they know at all times just what abilities are available.

Finally, Haldane would like to see better established the principle that no trained man be put in a nonspecialized post. He points to the brilliant physicist, Mosely, who joined the Sappers and got a bullet through his head at Gallipoli, and to himself, who served as an infantry officer but on his own admission made a better teacher of bombing. A trained man, if for no reason other than that he has a disciplined mind and good habits of observation, makes better material for training in some other specialized field than the green recruit.

While Haldane's remarks were addressed to British officers, they apply equally well to any army. His theme seems basically this: Since there is no possibility of divorcing science from war, the union might be made as effective as possible.



#### PORTRAIT OF AN EARTHQUAKE

If, during an earthquake, the world were sliced open like a grapefruit and the quake waves captured on the sliced surface, here is the pretty and revealing pattern they might make.

The wave fronts for the P, or push, waves are shown starting from an earthquake at the top, traveling in part through the denser core, and partially focusing at the bottom. Note the ring of shadow cast by the edge of the core. The distance, if you are interested, between successive wave fronts corresponds to one minute of travel.

On the next page is shown the seismograms from which are deduced the ideas about the earth's interior suggested by this sketch

## This Ball of Clay—How Old?

*Listening to the Earth's Interior. Is It Made of Iron, Green Cheese, or Cold Molasses?*

BY PHILIP M. MORSE

WE have nearly as much trouble finding out about the earth as we do in finding out about near-by solar systems. We of course know a little about the skin of rock, film of water, and litter of life on the earth's surface — constituting about one-tenth of one per cent of the earth's volume. But we know very little about the real earth, the mile after mile of unknown material beneath our feet. The stars we can see but cannot touch; the earth's interior we can hear and sometimes feel, but cannot see. The latter handicap is, perhaps, the greater.

If the earth were reduced to the size of a grapefruit, the atmosphere would be a hazy film, a few thousandths of an inch thick; the oceans would be a still thinner film of moisture; and the thickness of the layer of rock about which we know anything directly, would be less than a thousandth of an inch. When we know only the taste of a bit of the outer, shiny surface of a grapefruit, we can hardly claim to know much about the grapefruit.

The most striking fact about our grapefruit-earth is its extreme smoothness and regularity: It is much smoother and more regular than an actual grapefruit. True, if we were to run our fingers over it, we would feel a few dents beneath the oceans and a few rough spots on the continents; but the maximum depth of the dents and height of the bumps would be less than a hundredth of an inch. Most of the surface would be as smooth as if the ball had been turned, ground, and polished. It is the skin of wax, so to speak, with which we are acquainted. Only in the last score of years have geophysicists devised instruments

HOW THE EAR AND NOT THE EYE IS REVEALING THE STRUCTURE OF THE EARTH AND HOW NATURE'S MOST PERFECT TIMEPIECE IS PINNING DOWN THE OLD LADY'S AGE

which enable them to do more than guess about the nature of the earth under its skin.

Measurements of the over-all shape of the earth are best made by measuring the pull of gravity at various spots. This pull is usually measured by timing the oscillation of

a pendulum, and the result tells us how far the pendulum is from the center of the earth. Any local deviation of the underlying density of rock will alter the result somewhat, but this can usually be corrected for. As a matter of fact, in recent years, measurements of the pull of the earth have been used chiefly to determine these local deviations, as an aid in prospecting for oil and minerals. Oil companies have developed portable instruments which, it is claimed, measure gravity with a precision of one part in 100,000,000. This will presumably measure relative distances to the earth's center with an accuracy of less than one foot. These instruments someday will be used to make a complete survey of the earth's surface.

The fragmentary gravitational surveys made to date, with less accurate instruments, indicate that the earth is a slightly flattened spheroid, bulged around the equator. Within the accuracy of the measurements, they tell us that the earth has the same shape a liquid sphere would have if it were in equilibrium between its own gravitational pull and the centrifugal push of its own rotation. This is a very interesting result, for other measurements, a few of which we shall mention later, also seem to indicate that the greater part of the earth acts to some extent like a liquid.



This is not to say that if we could drill a hole down a few hundred miles, the interior would squirt out at us as an oil well does. It simply means that if forces act on the earth for a few thousand years, the earth will yield to them, more like tar or cold molasses than like water. If a cube of rock, 50 miles on each edge, were placed on the earth's surface, within a few hundred thousand years it would have sunk into the surface to approximately the depth given by the law of hydrostatic balance. If the rock were lighter than the earth beneath, it would come to rest with its top above the surrounding country; if it were the same average density, it would sink until its top would be approximately on a level with the rest. Many geologists are convinced that mountainous regions are simply places where the light crust is somewhat thicker than usual, making this part bob above the surface, like a cork in cold molasses. Analysis of gravitational surveys near mountains seems to corroborate this theory. However, there are many exceptions and differences of opinion on the matter, which will not be settled until a complete gravitational survey is made.

We are sure that the underlying material is heavier than the surface granite because we have weighed the earth, comparing its pull of gravity with that of a lead ball of known mass, and have found its density to be about twice as great as that of the surface material. Part of this increase of density can be explained by the crushing effect of the immense pressures in the interior, but this does not seem to be enough. The usual opinion is that there is an inner core, about the relative size of the seed in an avocado, of density about ten times that of water, perhaps consisting of a mixture of iron, nickel, and other metals.

Support for this picture comes from the science of seismology, which is a technique for diagnosing the earth's structure by listening to its internal rumblings — a standard medical practice. Every few weeks a minor readjustment of stresses in the more rigid outermost skin of the earth gives rise to what is called a major earthquake.

Several hundred seismographs, set up over the world, listen to the bumps and thuds of the earthquake wave as it echoes and re-echoes in the earth's interior. Since the earth is formed in onionlike layers above the core, and since each layer reflects and re-reflects the wave, unscrambling the recorded seismic racket is a complicated procedure. As a means of surveying the interior, this method is about as efficacious as would be the survey of a mountainous region which a blind man could make by shooting off a pistol and timing the echoes from each mountain. However, since we cannot see the interior, we must content ourselves with hearing, and, as a matter of fact, the calculated results show a surprising amount of detail. Professor Louis B. Slichter and Dr. C. L. Pekeris, '29, at M.I.T. are experts in this immensely complicated method of analysis.

Earthquake waves are of three sorts: compressional (called P, or push, waves); transverse (called S, or shake,

#### SIGNATURE OF AN EARTHQUAKE

*The M.I.T. seismograph in Maine made this record of an earthquake off the Californian coast. The quake record starts directly above this caption with the faint push waves coming*

waves); and, finally, the surface waves, usually the most intense but telling us little about the interior. Each type of wave travels at a different speed, changes from one type to another and back again at each reflection, and each tells its own story at the end of its travel. An analysis of the accumulated data on earthquakes of the last 40 years indicates that the granitic and basaltic material of the earth's crust is about 20 to 50 miles deep. Below this surface of demarcation (which goes by the horrendous title of Mohorovičić discontinuity) are several thicker layers of greater density and rigidity, down to a depth of 1,800 miles, and all presumably made of rocky material considerably denser than granite. This material is, like tar, rigid to sudden shock (S waves can travel in it), but it flows under steady pressure, also like tar. At a depth of 1,800 miles there seems to be another sudden change in material (called the Gutenberg discontinuity). Beneath this depth is the heavier core, much less rigid than the overlying layers, for it does not seem to transmit S waves. Since the P waves travel slower in the core than outside, there is a tendency toward a focusing of the waves at a point opposite the center from the source, just as light is partially focused by a glass sphere. Whether the core material is liquid in the usual sense of the word is rather hard to say, unless we do not mind making statements which cannot be proved and also cannot be disproved.

With her innards partly located, we next turn to the question of Mother Earth's age. Perhaps this is an impertinent question to raise, but its answer will help tell us the history of her own development, as well as telling us about the evolution of that greenish surface mold called Life. Many attempts have been made to determine the age of various features of the earth, from estimates as to how long it might take to increase the salt in the ocean by a given amount, to guesses as to how long it would take to wear down a mountain range from so high. There was even an estimate obtained by guessing how hot the earth was when it was formed and then estimating how long it would take to cool down. This estimate has been viewed with some skepticism, however, since it was discovered that if the earth contains as much radioactive material throughout as it does on the surface, it would not be cooling down, but would be heating up steadily! In fact, one per cent of this radioactive material would still make too much heat to get rid of. It is generally agreed today that we simply do not know enough to make any statement about the earth's temperature, except that there has not been enough time for the earth, since its birth, to come to temperature equilibrium, though it has long since come to almost perfect mechanical equilibrium. The earth has relaxed, so to speak, but it has not cooled off yet.

*through the interior of the earth. Just before the cut breaks across the pages, the shake wave comes, and shortly after, the widely swinging, slow surface wave. The quake, of considerable duration, continued its record on the line below the starting line*

Since the discovery of radioactivity, however, geologists can dispense with such outlandish methods of guessing and concentrate on utilizing nature's most perfect timepiece. As an example of pigheaded persistence, a sample of uranium beats anything else known to man. Whether the pressure be thousands of tons per square inch or nothing, whether the temperature be millions of degrees or zero, the sample will go to the devil in its own sweet way, disintegrating a definite, fixed fraction of itself each year. During this disintegration uranium produces, among other things, radium and radium emanation (which in turn disintegrate), and helium and lead (which do not disintegrate). The helium comes off at high speed, as alpha radiation, but is soon battered into quiescence by the other atoms in the rock and remains trapped along with the lead as long as the rock is undisturbed. Therefore if we can measure the rate of production of helium and lead in the rock today, and the total amount of either helium or lead produced in the rock by radioactivity, we can determine how long it has been since the rock was formed. Considerable work on age determination is being done at M.I.T. by Dr. W. D. Urry, Professor R. D. Evans, and their co-workers.

The amounts of material measured are excessively minute, since only a minute amount of uranium is present in ordinary rock. In fact, the amount is so small that the lead produced by disintegration cannot be separated from the lead already there, and the lead-content method must therefore be confined to ores with a high uranium content. This imposes too great a restriction on the sorts of specimens measurable, so that the helium-content method seems at present to be the most generally applicable one. A known sample of the rock is put into a furnace, the helium boiled off, all the other gases removed, and the volume of the helium left is measured. Since this amount, at atmospheric pressure, has the volume of a few grains of salt, it is obvious that every precaution must be taken to obtain a reliable result. The precautions are evidently adequate, for different methods agree with each other to a surprising extent. The measurements of Professor Evans, who uses a vacuum furnace to boil the rock in order to get the helium and who counts the alpha particles to determine their rate of production, check fairly well with those of Dr. Urry, who uses a flux to help boil out the helium and who ascertains the rate by determining the amount of radium emanation. And there is indication that the check will be almost perfect as soon as the reference standards have been completely correlated.

There are a few other methods which have been suggested or used occasionally: One of them, utilizing the radioactivity of potassium, is not satisfactory because the end product, calcium, was usually in the rock at the

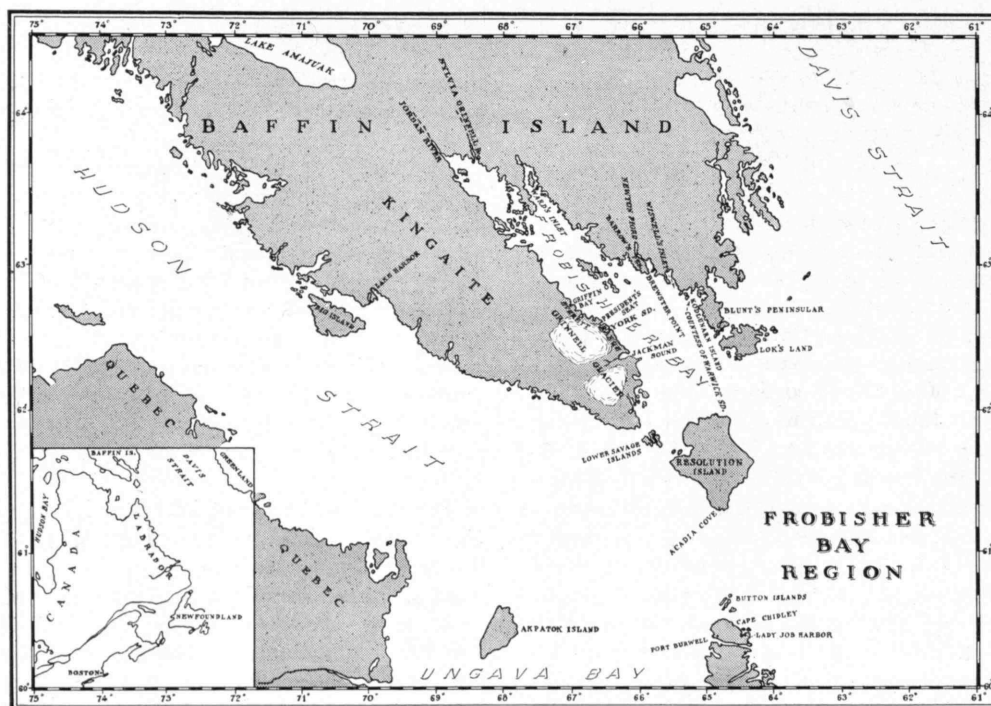
start; and another, utilizing the radioactivity of rubidium, promises well, but has not been used to any extent yet.

At present only a few time measurements have been made, and these are not especially satisfactory, considering the possible accuracy of the present methods. The chief difficulty seems to be in the so-called geological error in locating from what geological era a given specimen comes. Unfortunately none of the radioactive methods can be used on sedimentary rocks; so that a specimen of igneous rock — a basalt or granite — must be found which came to the surface and solidified during the specified era. Continued collection of specimens and correlation of results will probably remove these difficulties.

The results at present indicate that the beginning of the Tertiary period — the end of the age of reptiles and the beginning of the age of mammals — came about 50,000,000 years ago; the beginning of the Mesozoic era — the age of reptiles — came about 200,000,000 years ago; and the beginning of the Eozoic — the possible beginning of life — came about 500,000,000 years ago. As to the possible age of the earth, no rock has been found which is older than 1,800,000,000 years. This is checked by measurements of meteorites — chance visitors from the rest of the solar system — whose ages vary from a few hundred million to 2,000,000,000. The best guess at present seems to be that the earth's surface solidified (if it did solidify) about 2,000,000,000 years ago. If we compress this time scale into a figurative 24 hours, the time from midnight to 6 P.M. next evening was occupied by the earth in settling down and getting ready for occupancy; at about 6 P.M. life began; at 10 P.M. reptiles began; since 11:30 mammals have flourished; and from 11:58 to midnight man has strutted. One-fifth of a second has passed since the pyramids. During the day the surface skin has been fairly active: Continents have risen, fallen, and drifted around; mountain ranges have popped up and frayed out in a rather busy manner. Except for the first hour or so, however, the major volume of the earth has been reasonably quiet.

The above time scale is somewhat longer than was fashionable 20 years ago, but it is supported by much of the recent evidence, astronomical as well as geological. It still gives the sun enough time to splash out the earth, or whatever it did; and it gives the primeval chromosomes enough time to mutate, or whatever they did. However, a few more years of coöperation among geologists, geophysicists, physicists, and chemists (plus a bit of financial support) will result in a much more coherent picture. A complete gravitational survey of the earth will clear up many debatable questions about the earth's structure, and an extensive age survey will enable all the rocks of the surface to be arranged in an accurate time sequence. The results will probably inaugurate a new era in the study of historical geology; and I suppose that is an important matter. At any rate, Mother Earth is gradually being persuaded to reveal her age and anatomy.





John Germond

*Few places so near civilization are as little known as Baffin Island. Here is an approximate map showing places described in the article below*

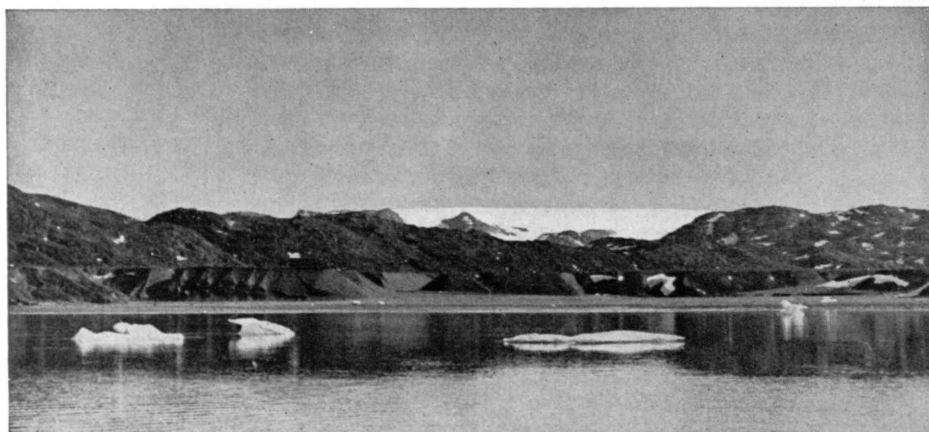
# Spectacular Frobisher Bay

*Where Even the Trout Grow Large and Glaciers Drop 2,000 Feet from the Icecaps*

BY MARTIN J. BUERGER

**I**TS shores afford the grandest scenery in eastern North America. Its icecaps, the most southerly perpetual inland ice along our shores, are visibly at work fashioning cathedral-like buttresses and spires from its lofty, rocky shores. Its tides rise and fall 55 feet. Its trout approach a fisherman's dream of 2½ feet. Its shore line has risen 180 feet since the ice age.

I speak of Frobisher Bay — the long, narrow, wedge-shaped thrust which the ocean makes into the southern extremity of Baffin Island, north of Labrador. Since my visit there last summer with Lieutenant Commander Donald B. MacMillan's expedition, my enthusiasm for this little-known section has steadily increased, along with the feeling that the region — never accurately



## BAFFIN LAND IS RISING

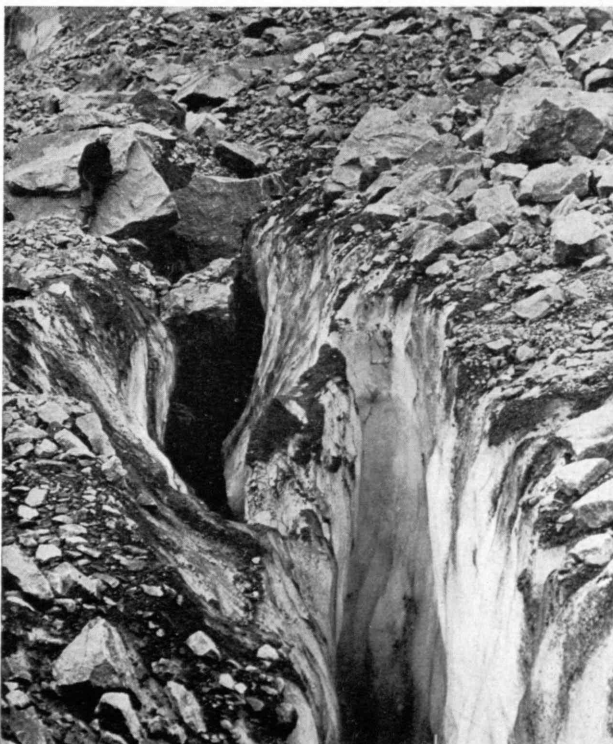
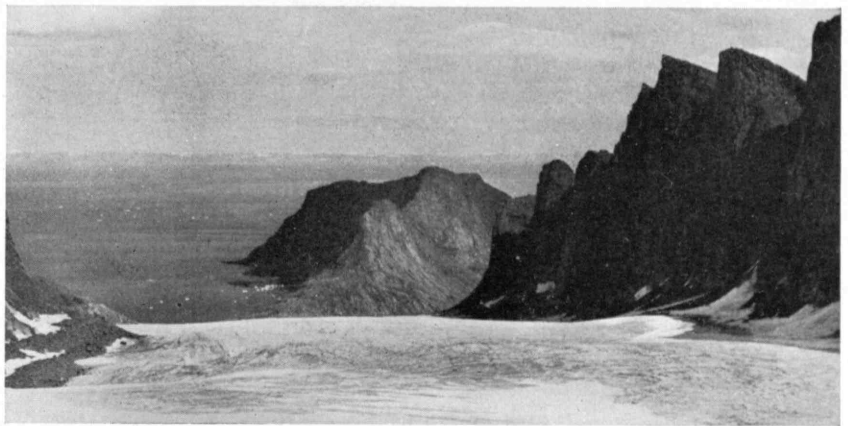
*Relieved of most of its ice load following the great Ice Age, Baffin Island apparently rose some 180 feet above the present sea level. Evidence of this rise is shown here by the wave-cut wall of the apron plain near the water's edge. The river, which empties in this cove (Jackman Sound), once meandered over the apron plain. The glowing southeastern part of the Grinnell icecap is visible in the background*



#### FROBISHER BAY

Above. On a quiet day the author caught, from Brewster Point, this view of the Everett Range, including Mount President's Seat, 30 miles away. Here is a striking example of that arctic phenomenon, cloud glow or iceblink, produced by light reflected from the Grinnell icecap. In the foreground is the MacMillan expedition schooner.

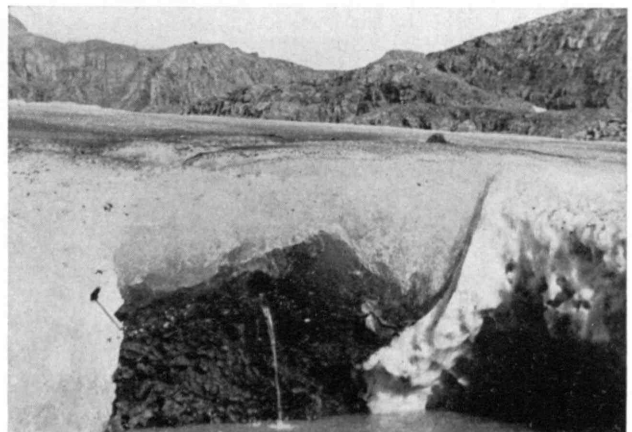
Right. View down one of the glaciers from its source at the edge of the icecap, about 2,000 feet high



#### GLACIER CLOSE-UPS

Left. Huge echelon crevasses, or tension cracks, formed by tearing away of the faster moving central ice from the side ice whose movement is reduced by friction with the rock walls. Note the man at the left and the angular granite blocks which constitute the edge of the lateral moraine. The Frobisher Bay glaciers offer an excellent opportunity to study some of the puzzling flow phenomena of glaciers.

Below. Toe of the glacier shown above. Water is shown flowing out of an internal drainage channel. Note the geologist's pick for scale



mapped — is worthy of study by geologist and cartographer. I would even recommend the bay, if you can find transportation, as an ideal destination for a summer excursion. Some details about this magnificent country may explain why.

Discovered by Martin Frobisher in 1576, the bay bearing his name was explored by him for a distance of about 130 miles into the interior of Baffin Island, under the impression that it was the much hoped for trade route to China, the famous Northwest Passage. When Frobisher returned to London to tell of his discoveries, some of the quite ordinary, black amphibolitic rock brought back by one of his crew was incorrectly identified as gold ore, and this precipitated the first gold rush into the northern New World. Headed by Frobisher, an



#### THE TIDE DID THIS

*The MacMillan expedition's schooner, the Gertrude L. Thebaud, nearly came to grief when an ebbing tide of over 24 feet left her unexpectedly high and dry. Toward the head of the bay the tides are reputed to reach the tremendous height of 55 feet*

expedition set out in each of the two following years, and both times returned laden with black rock. But before the second expedition had returned, the "ore" had already been proven worthless.

The north and east sections of Frobisher Bay were again explored in the years 1860, 1861, and 1862 — this time by Charles Francis Hall. He explored the bay to its very head and thus discovered that this arm of the sea was not a through passage, as Frobisher had supposed, but rather an inclosed body of water. The place names in and about Frobisher Bay are due entirely to Frobisher and his men and to Hall, all of whom named important features after their friends or patrons.

This region has been more recently visited by several expeditions under the general leadership of Lieutenant Commander Donald B. MacMillan. The 1937 MacMillan expedition spent about a fortnight of the summer in and about Frobisher Bay. As a member of this expedition, I felt that I was continuing a Technology tradition, for Professor Alfred E. Burton and George H. Barton, '80, were with the sixth Peary expedition to northern Greenland in the summer of 1896 and, on their way, landed at Lower Savage Islands, just south of the mouth of Frobisher Bay.

Frobisher Bay is reached by sailing along the Labrador coast to Cape Chidley, then across Hudson Strait to Resolution Island, which lies just south of the mouth of the bay. Hudson Strait is an outlet for the pack ice of

the Hudson Bay region, and the pack can usually be depended upon to come pouring out of it into the North Atlantic until the latter part of July, preventing a crossing to Baffin Island until this season. The currents in the strait run from five to seven knots, gathering the ice into strings and clots of ever changing configuration and making navigation difficult. The 1937 MacMillan expedition waited six days in the vicinity of Cape Chidley for alleviation of ice conditions, finally making the crossing to Acadia Cove, Resolution Island, on July 27. Several pack clusters were penetrated during the crossing.

The tides in Frobisher Bay are so extreme that they must receive the constant attention of any expedition. At Brewster Point, on the northeast shore, a tide of 24.5 feet was measured, while in Griffin (?) Bay, somewhat farther in along the southwest shore, the tide was nearer

#### ESKIMO FASHIONS

*Women of the Brewster Point Eskimo encampment. The woman's dickey, or parka, differs from the man's by having a short apron in front and a long tail behind, giving them the appearance of oversized beavers — a rigid fashion caused by the polar bear, as explained on page 282*

*Notice the raw seal meat on the tent, out of reach of the dogs*



30 feet. Generally speaking, it can be said that the tides increase toward the head of the bay and are reputed to reach the tremendous height of 55 feet, a figure which places Frobisher Bay among the several regions of the world having very great tides. Naturally it is extremely hazardous to navigate such a body of water. Not only is it difficult to find an anchorage which is suitable both at high and low tides, but the tidal currents are very strong. This is apparent even in the deep water off Resolution Island, in the mouth of Frobisher Bay, where the sea rushes by the rock cliffs of the island in much the same manner that swift water sweeps the banks of an island in a river. The currents are even stronger within the bay itself, especially since the tide ebbs in the extremely short time of three hours or less.

All the maps and charts which show the bay are based upon the one made by Hall in the 1860's. Hall's work, of course, was of a reconnaissance nature and therefore his map is only a sketchy, inaccurate outline of the shores. Indeed, a great part of the bay, including almost the entire southwestern shore, was not actually visited by Hall, although it was tentatively sketched in by him from the opposite shore, some thirty-odd miles away. This coast is consequently indefinite, and the identification of any of its features by (Continued on page 279)



# There Are Good Germicides

*But Some Are So Valueless That Their Purchase Is a Waste of Money*

BY CECIL G. DUNN

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HOW THE BIOLOGIST EVALUATES A GERMICIDE . . . RECENT ADVANCES IN THE CONTROL OF INFECTION . . . THE NEED FOR WIDER PUBLIC KNOWLEDGE OF THE USES AND LIMITATIONS OF ANTISEPTICS . . . THE POSSIBILITY OF INADEQUATE GERMICIDES STIMULATING THE GROWTH OF BACTERIA

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MAN has been made germ conscious. He visualizes in every microbe a menace to his personal safety. How can these public enemies be destroyed or rendered inert? As the result of a demand for germicides and antiseptics to serve these worthy purposes, industries have grown up. Many of these industries are excellent and are pursuing their objectives through careful chemical and bacteriological research, but some are still willing to deal in preparations of so little value that their purchase often constitutes a waste of the public's money. One needs but to enter any of the soda-fountain drugstores to determine for oneself the multiplicity of proprietary compounds, valuable or otherwise, or read current magazines to see how vigorously they are being advertised.

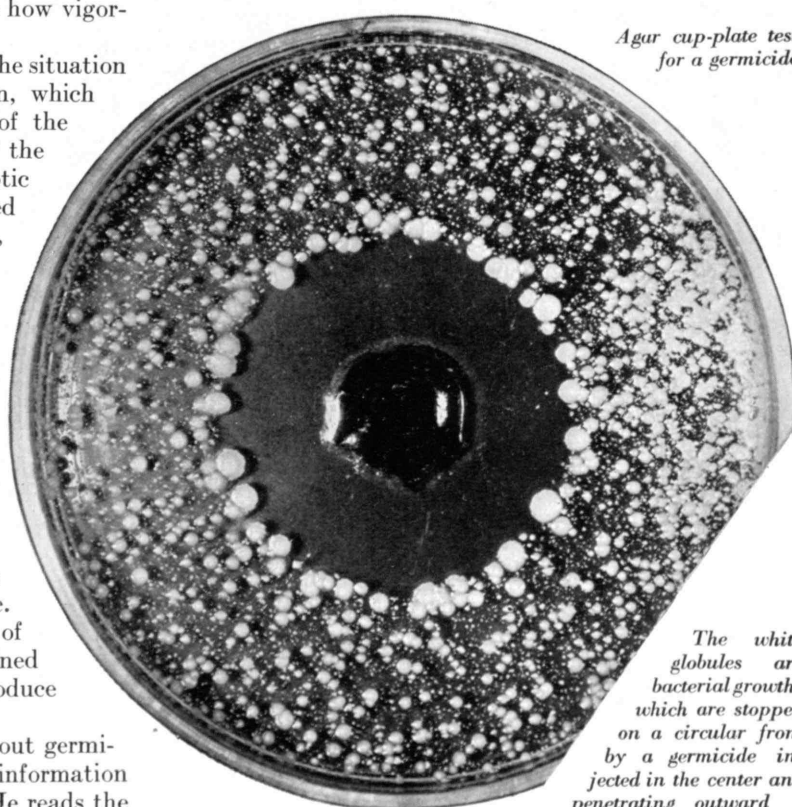
That there has been real improvement in the situation cannot be gainsaid. The following caption, which appeared on one product, is illustrative of the labels occasionally found in the heyday of the not too long ago: "A most reliable antiseptic and germicide. Its action upon all diseased surfaces is not only curative but corrective, reducing inflammation and destroying all disease germs known by all doctors to be the cause of sickness and disease." Thus was advertised the first and probably the last perfect germicide! Although the conditions are changing, were it not for certain regulations and efforts of such agencies as the Food and Drug Administration, various state departments of inspection, and the American Medical and Public Health associations, there might still be on the market a flood of compounds of questionable germicidal or antiseptic value. It is notable, too, that the Association of Germicide Manufacturers is making determined efforts to improve this condition and to produce materials of positive quality.

The average person knows very little about germicides or antiseptics. Frequently, what little information he ascertains comes from inexact sources. He reads the

extravagant claims prepared by advertising agencies and is impressed. He gets the opinion of the drugstore clerks who sell the products, but who often know little more of actual fact about the compounds than the prospective customer himself. The great buying public must rely upon the veracity of the manufacturers, upon doctors, the periodicals, the radio, or the word of someone else. The public can rarely get the opinion of the bacteriologist who has made a careful scientific examination.

The words "germicide" and "antiseptic" connote a positive action and in themselves offer a sense of assurance to the buyer. But they are words with varied meanings to the well-informed. It is generally helpful to define such terms as may have divergent meanings. Literally, a germicide is a "substance or agent which destroys germs or microorganisms." We may ask: Under what conditions will it do this? In what dilution? How rapidly does it act?

A term often used synonymously with germicide, but erroneously so, is antiseptic. An antiseptic, as defined by the Food and Drug Administration, is "a substance which, when applied to microorganisms, will make them harmless." This is accomplished either by destruction of the microorganisms or by inhibition of their growth.



*Agar cup-plate test  
for a germicide*

*The white  
globules are  
bacterial growths  
which are stopped  
on a circular front  
by a germicide in-  
jected in the center and  
penetrating outward*

When substances, such as gargles or douches, are to be used in contact with the body for a few seconds only, the organisms must be destroyed by the recommended dilutions during the time of contact with the body if the substances are properly to be designated as antiseptics. Substances, such as salves or ointments, which may be in contact with the body for fairly long periods of time may be termed antiseptic if they prevent the growth of microorganisms during the period of application.

By disinfection, in the scientific sense, is meant the destruction of infective microorganisms. The term "disinfection" has, however, had different significance during the passage of time. At one period, before the advent of the germ theory of disease in the 19th Century, the destruction of any putrefactive decomposition or the removal of noxious odors emanating from such matter was considered to be disinfection. From these beginnings arose the idea, still persistent in the minds of many persons, that a strong-smelling substance is a good disinfectant, simply because it masks odors. Today its effectiveness is quantitatively measured by bacteriological tests, and the germicidal strength is expressed by a "phenol coefficient." A phenol coefficient states the potency of a compound toward *Staphylococcus aureus*, or some other microorganism, at a given temperature, in comparison with the potency of phenol (carbolic acid). For example, if a chemical agent destroys a pathogen in a dilution of 1/30,000 in ten but not five minutes and phenol accomplishes the same result in a dilution of 1/60 under the same conditions, the phenol coefficient is said to be  $\frac{30,000}{60}$ , or 500.

History reveals that the use of chemical agents in preserving and in fumigating is an ancient art. The Egyptians used spices, salts, preservative oils, often with drying, to preserve the human body. The effectiveness of their methods is readily verified. Sulphur was burned in the period of Hippocrates in an effort to counteract plague, and at one time it was used for purifying wool against contagious diseases. Yet in spite of the fact that chemical agents were used for the foregoing purposes, there is no evidence that man thought of using any of these agents to prevent infection of wounds or as a preoperative measure.

McCulloch relates that at the beginning of the 19th Century a woman's chances of living during confinement were about seven times greater at home than in a lying-in hospital. Today this is not true. Before the work of Semmelweiss and Lister, a soldier submitting to a major amputation had approximately one to four chances in ten to live, while a person undergoing a similar operation in a civilian hospital had four to seven chances in ten to survive. Thousands of individuals thus needlessly sacrificed their lives on the altar of ignorance, for the use of disinfective or aseptic methods, such as are now employed, would have prevented most of these untimely deaths caused by infections.

As the result of the careful scientific research of some of our scientific forebears, there has been accumulated knowledge concerning chemical disinfection and disease which has saved untold numbers of lives, prevented infection and sickness, and increased the happiness and well-being of mankind. Around 1800, Cruikshank of

England and Guyton de Morveau of France first proposed the use of chlorine as a disinfectant. Lefèvre, in 1843, advocated the use of chlorine water as a disinfectant, and during the same year he and Dr. Oliver Wendell Holmes brought to the attention of the public the contagious nature of puerperal fever. Dr. Holmes adopted the practice of washing his hands with chloride of lime after visiting women who were ill with this fever.

Semmelweiss, a young surgeon, assistant in a ward of a great lying-in hospital in Vienna, observed, in the year 1846, that mortality from puerperal septicemia, a dreaded and deadly disease, was greater in those wards visited by medical students than in wards not visited by them. It was the practice in his ward for students to assist in the autopsy of women who had died from puerperal fever and afterwards to assist in delivery. One day in the hospital a doctor was accidentally cut by the knife of a man who had just completed an autopsy on a woman dead from the fever. The doctor died soon afterwards from blood poisoning. Semmelweiss believed that the high mortality from puerperal fever was unnecessary, and in endeavoring to conquer the disease, he reasoned that the cause of death must be carried, as an invisible poison, from the cadavers to wounds in the patients by the hands or implements. He immediately (1847) ordered all students to wash their hands and to soak them thoroughly in water containing chlorine. At once the death rate from puerperal fever in the hospital dropped sharply. Attention directed to the cleansing of instruments, beds, and linen was amply rewarded, as more young mothers returned alive to their families. The young surgeon, who saved hundreds and ultimately even thousands of lives through his observations concerning the transmission of puerperal fever, was ridiculed for his ideas and practices by many members of the medical profession. But, though it required several years to convince persons of the soundness of his methods and though hundreds of young women died needlessly, the work of Semmelweiss was not in vain.

With the development of the germ theory of disease by such men as Bassi, Henle, Pasteur, Davaine, and Koch (especially Pasteur and Koch), it was but a step to the advent of antiseptic surgery. Dr. Joseph Lister, later Lord Lister, now recognized as the father of antiseptic surgery, first used carbolic acid in operating and in the disinfecting of wounds in the year 1865. This chemical, now usually called phenol, which was discovered by Runge in 1834 and recognized as a disinfectant almost immediately, was likewise used by him as a soak for surgical instruments. It would not be a simple undertaking to calculate the number of lives saved by the use of antiseptic surgery. Had its use been adopted earlier, the medical history of operations would have been far less morbid. Yet this type of surgery, which depends upon the application of chemical solutions to destroy any microorganisms which may be present, was replaced during the latter part of the 19th Century by aseptic surgery, wherein germs are prevented from coming into contact with wounds by the use of the most stringent methods of cleanliness.

The period dating from the germ theory of disease to the present has been a period of continuous experimentation in disinfection. The use of (*Continued on page 284*)

# Chemicals That Cure

BY TENNEY L. DAVIS

*AS Dr. Dunn points out in the preceding article, there is a possible relation between chemical disinfection and the rapidly developing science of chemotherapy, the treatment of certain diseases by chemical compounds. Below, Professor Davis gives some of the little-known background of Sulfanilamide,\* the chemical that has recently skyrocketed into public consciousness and defines that branch of science which seeks and applies chemicals that cure. Another example has just been announced as this article goes to press—the successful use of nicotinic acid to treat pellagra. THE EDITOR*

**A**BOUT a year and a half ago a prominent politician of Boston lay sick in hospital with a streptococcus infection of the inner ear. A dangerous mastoid operation was indicated, but the skillful physician who was attending him saved him without surgery by the use of the new synthetic drug, prontosil. At that time the drug was beginning to be recognized as one which would kill the *Streptococcus haemolyticus* wherever the latter might be in the body, but the drug's present wide use was not suspected by the majority of physicians.

The first German patent for prontosil (No. 607,537, granted to Drs. Mietzsch and Klarer) was dated Christmas Day, 1932, and was followed quickly by others, all for azodyestuffs derived from sulfanilamide. The results procured by the use of these substances in the treatment of streptococcus infections were almost too good to be true; they were so remarkable that Dr. Domagk, director of the experimental pathological laboratory at Elberfeld, delayed publication until February, 1935, by which time they had been tested thoroughly and confirmed fully. In 1935, too, Drs. Tréfouël, Nitti, and Bovet in France, in consequence of investigations in the laboratory of Professor Fournieu, made public their finding that the simple substance, sulfanilamide (which we now designate in this country as prontosil album), has the same therapeutic effect as its colored azo derivatives. British investigators made extensive clinical studies. In July, 1936, at the London meeting of microbiologists, the new antistreptococcal remedies were much discussed in conversation, though they formed the subject of no formal lectures or demonstrations, and it is probably there that Drs. Long and Bliss of the Johns Hopkins Hospital, Baltimore, learned of the results which Colebrook had obtained in England. Early in 1937 the Johns Hopkins Hospital, in consequence of sulfanilamide and its derivatives, was running month after month without a single mastoid operation. The opinion prevailed that the new therapeutic agents were effective against *Streptococcus haemolyticus* infections, perhaps against other streptococcus infections. But for other types of pathogenic organisms, there was no information—and no enthusiasm. Within a year, sulfanilamide has swept the country. It is now believed to be good for all sorts of coccus infections—streptococcus, staphylococcus, meningococcus, gonococcus, and so on. A medical friend tells us that he believes it to be the greatest advance in chemotherapy since salvarsan.

Chemotherapy, like other branches of medicine, proceeds by putting things into, or onto, the body of the patient. It is interesting to distinguish it, on the one hand, from the extremely ancient Galenic therapy, which makes use of plant and animal materials powdered, infused, and decocted and, on the other hand, from the most modern therapy of all, which makes use of biological products, vaccines, antitoxins, and serums. Chemotherapy makes

use of pure substances, generally prepared by chemical means. Its earliest important example is, perhaps, the use of sulfur for the itch, a disease which yields neither to the natural resistance of the body nor to galenic drugs. Another example is the use of mercury compounds in the treatment of syphilis, for which disease mercury appears to be specific. And another—the most notable example of recent times—is salvarsan, an organic compound of arsenic prepared synthetically. The case of quinine for malaria is a bit ambiguous, for quinine is a pure chemical substance which is isolated from the bark of a tree. Ephedrine (for asthma, and so on) may be procured from a plant, but much of the material of commerce is actually produced by chemical synthesis. Sulfanilamide and its derivatives do not occur in nature.

During the past year sulfanilamide and its derivatives have saved innumerable patients from the dreaded mastoid operation, from meningitis, from an otherwise fatal blood poisoning caused by the common pus-forming staphylococcus. Many are now living in health who would certainly have died except for sulfanilamide. A year ago it was being tried by a few bold doctors for the treatment of gonorrhea. Today it is suspected of being the panacea.

For gonorrhea, sulfanilamide or some one of its derivatives is administered in large doses. The patient must be watched for untoward physiological reactions—it may be necessary to modify or discontinue the dosage—and in successful cases the infection is completely removed within five or six days. The drug is reported to be especially useful for dealing with old and deep-seated infections. Typical reports indicate that at the public health clinics which are free, where no real supervision of the patients is possible, prontosil for the treatment of gonorrhea is successful in about 10 per cent of the cases; in physicians' private practices, where the patients are probably more intelligent and follow the physicians' directions more carefully, it is about 40 per cent successful; in hospitals, where the patients are in bed and can be watched at all times, it is successful in about 90 per cent to 100 per cent of the cases. It is evident that the remedy must be used under close supervision—and evident, too, that there is reason to hope that gonorrhea may ultimately become as uncommon as smallpox.

Drs. Dochez and Slanetz of the College of Physicians and Surgeons of Columbia University and the Presbyterian Hospital, in a preliminary paper in *Science* (February 11, 1938) report remarkable results in the treatment of canine distemper by means of a new derivative of sulfanilamide, namely, sodium sulfanilyl sulfanilate. It is a white, crystalline substance, easily soluble in water. The dose for small animals is one gram per kilogram of body weight, or about seven grains per pound. Cats, rabbits, and ferrets have been given one gram of the substance every day for two weeks without loss of weight or of appetite or any other unfavorable symptoms. The material circulates in the blood for a short time at a relatively high concentration and is completely excreted within 24 hours.

Canine distemper is believed to be closely related to human influenza. Both diseases are caused by filterable viruses, as are also infantile paralysis and epidemic encephalitis. Sodium sulfanilyl sulfanilate appears to be the first chemical agent which is effective against any of the virus diseases, but the range of its activity remains to be investigated. The preliminary experiments and the extraordinary success of sulfanilamide give us reason to hope that another large group of the dreaded enemies of mankind may be brought under control.

\* Pronounced sul-fa-nil'-a-mid'



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# THE INSTITUTE GAZETTE

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PREPARED IN COLLABORATION WITH THE TECHNOLOGY NEWS SERVICE

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## *Open House*

**B**ACK in the spring of 1922, student members of the American Society of Mechanical Engineers at the Institute sent out invitations for an evening tour of the steam and hydraulic laboratory. The success of that evening, much enjoyed by a small group of visitors, led to a somewhat more elaborate program in the following spring, and thus was started an event of great public interest, the Institute's Open House.

This year on Saturday, April 30, Technology will hold its 14th Open House. Instead of a few visitors for an evening, it will entertain some 25,000 guests from two o'clock in the afternoon until 10 P.M.

The program of this year's Open House will have many new and interesting exhibits that will indicate what has been accomplished in various fields in the past few years. There will also be ample evidence of the interests of students in various cultural fields, as in the numerous undergraduate activities, including student publications, the drama, debating, music, and sports.

Open House is planned and managed entirely by the students, through the Open House Committee. The staff coöperates in arranging exhibits and lectures in all departments, a task that occupies the spare time of a large group of the Faculty and students for weeks in advance of the event.

## *Alumni Day Notes*

**R**ECOGNITION of the significance of moving the School of Architecture to Cambridge and of our final departure from Rogers will supply the keynote for Alumni Day on June 6. The committee in charge of plans announces the acceptance of Dr. C.-E. A. Winslow, '98, Yale's distinguished professor of public health, as the speaker at the farewell ceremonies following the symposium in Huntington Hall in the morning.

Dr. Winslow was a member of the Institute's biology staff for a decade following his graduation and, despite his extraordinarily busy professional career, he has been a loyal and active Alumnus. His address should be one of the high lights of the program.

Careful plans are being made to entertain the wives of Alumni during the day. Each year the attendance of women has increased, as more and more Alumni find that their wives enjoy returning to the Institute with them. This year a committee of Technology Matrons, headed by Mrs. Murray P. Horwood, '19, is ready to welcome a still larger group.

## *On the Corporation*

**G**ORDON S. RENTSCHLER, President of the National City Bank of New York, was elected a life member of the Institute's Corporation at its meeting

on March 9. Mr. Rentschler had been a special term member since January, 1937. To fill his unexpired term, the Corporation elected Colonel Edward A. Deeds, President of the National Cash Register Company, to special term membership.

Colonel Deeds is a graduate of Denison University, of which he is also a trustee. In addition to being head of the National Cash Register Company, he is chairman and president of the Niles Bement Pond Company, the Shepard Niles Crane and Hoist Corporation, the General Sugar Corporation, and director and president of the Miami Conservancy District. He is a director of the American Rolling Mill Company, the Mead Corporation, and the General Machinery Corporation. Colonel Deeds is a member of the American Society of Mechanical Engineers, the Society of Automotive Engineers, the American Institute of Electrical Engineers, and the Army and Navy Air Service Association. His fraternity is Beta Theta Pi, and he is a member of various clubs.

Like Colonel Deeds, Mr. Rentschler, the new life member of the Institute's Corporation, is a native of Ohio. He was graduated from Princeton in 1907 and is a life member of its board of trustees. He is a director of All American Cables, Inc., the City Bank Farmers Trust Company, Postal Telegraph and Cable Company, International Banking Corporation, the General Machinery Corporation, the Home Insurance Company, the Federal Insurance Company, and many others. He is also a member of the Ohio Society of New York.

## *The Dewey Library*

**T**HE third of the Institute's departmental group libraries, which so efficiently supplement the service of the main Library, has been opened in the Pratt School of Naval Architecture, where it occupies the large room on the third floor formerly used as a lecture hall. The Eastman Library, first of the branches serving several departments, was opened in 1932, for the convenience of the Departments of Physics, Chemistry, and Mathematics. A year later the Lindgren Library, named for Dr. Waldemar Lindgren, former Head of the Department of Geology, was established for service to the Departments of Mining, Metallurgy, and Geology.

The newest of this group has been named for Professor Emeritus Davis R. Dewey, for many years the distinguished Head of the Department of Economics and Social Science. It will provide much-needed library service to the Departments of Civil Engineering, Business and Engineering Administration, Economics and Social Science, Naval Architecture and Marine Engineering, and Mechanical Engineering. The latter department has never had a branch library, and a special selection of mechanical engineering material is now being made by Professor Joseph H. Keenan, '22.

The room occupied by the Dewey Library was completely remodeled and now has a wide balcony of reinforced concrete on three sides, with a capacity of 30,000 volumes. On the main floor are stacks for 19,000 volumes. Reading and reference tables seat 76 on the main floor and 29 on the balcony, where every alcove has a study shelf and chair. By a rearrangement of the ventilating system both the balcony and main floor are exceptionally well ventilated. The walls of the room are a soft pastel green which harmonizes with the color of the stacks and fittings. Special consideration was given to lighting, with the result that a system of overhead holophane flush-ceiling units obviates the necessity for individual table lamps, which are seldom satisfactory for library purposes.

The new library is under the charge of two trained librarians, one of whom supervises books and periodicals of the engineering departments, while the other will have charge of the sections for economics, social science, and business and engineering administration. The libraries will cooperate with the staff of the newly created Industrial Relations Section, which has its headquarters in an adjoining room. Books and periodicals in the labor and industrial field will be located in the library proper, while pamphlets, industrial and labor reports, and miscellaneous material will be filed in the headquarters of the Section.

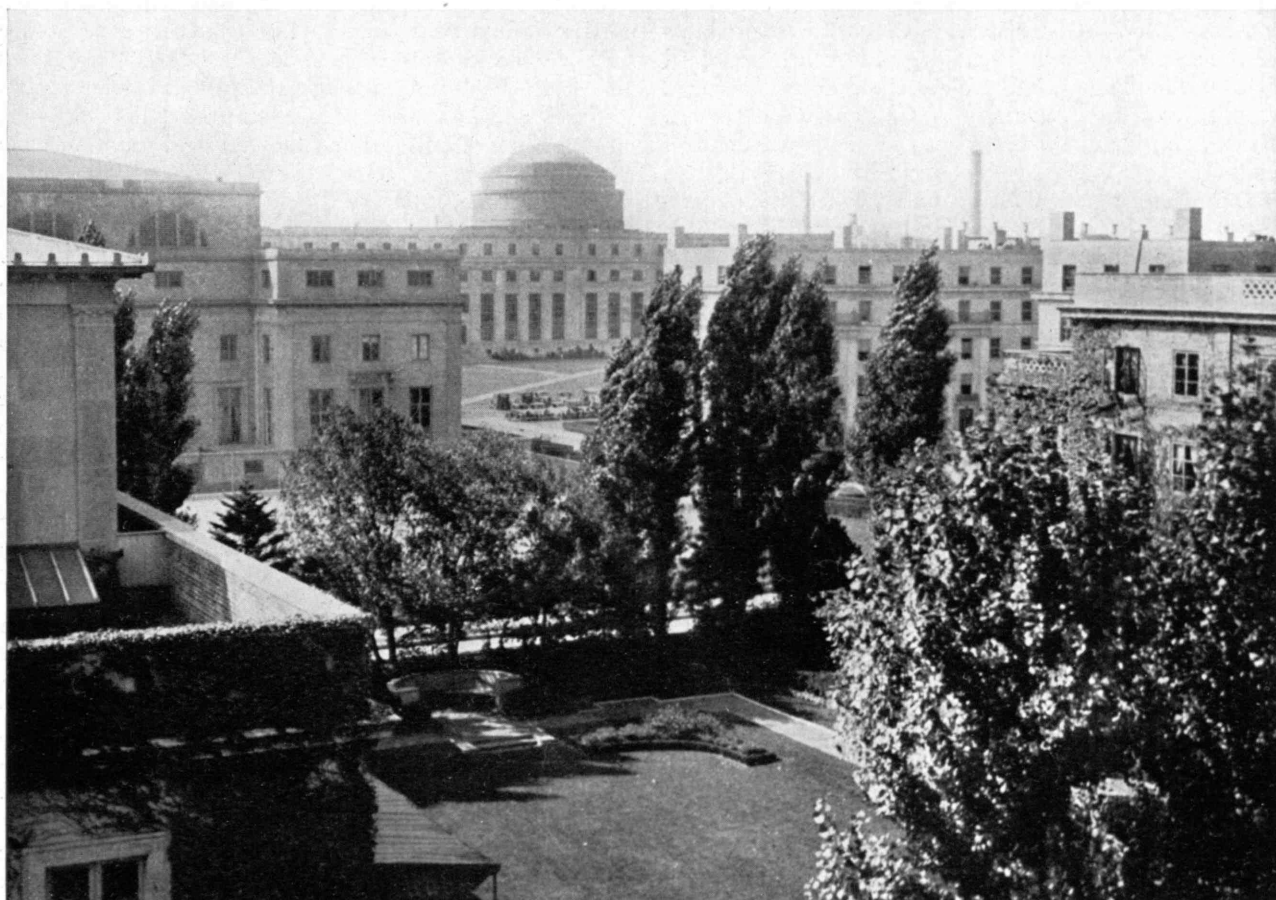
Construction of the Dewey Library was almost wholly an Institute project, for the work of remodeling was supervised by Albert V. Smith, '20, superintendent of buildings and power, while Professor Walter C. Voss, '32, directed the structural details and Harry J. Carlson, '92, cooperated in reviewing the architectural design.

### *New Degrees*

THIS year the Institute will begin awarding separate graduate degrees in naval architecture and in marine engineering. Establishment of the new degrees was voted by the Corporation at its meeting on March 9, in recognition of the opportunities for specialization in each of these fields in the postgraduate years. Students completing the undergraduate requirements will continue to receive the degree of bachelor of science in naval architecture and marine engineering.

### *Saturday Courses*

A SPECIAL program of week-end courses in modern textile testing and research methods, designed primarily for executives, research directors, and others interested in textile manufacturing, will be given at the Institute on ten successive Saturdays, beginning April 2.



*Beginning next fall the present Graduate House, as reported in The Review last month (page 232), will become the Senior House when the graduate students move to the newly acquired Riverbank Court Hotel. Here is a view from the upper stories of the Senior House. In the immediate foreground are the President's house and garden and across the yard lies the Eastman Research Laboratories, forming the east side of the main educational group*

The program is under the direction of Professor Edward R. Schwarz, '23, and the staff of the textile laboratory of the Department of Mechanical Engineering.

In addition to demonstrations and conferences, laboratory exercises have been arranged to provide opportunity for a limited number of students to use equipment for microscopical and physical analysis of fiber, yarn, and fabric, and to familiarize themselves with the newer techniques in textile research.

### *Interesting Technology Women*

OUR readers have doubtless been aware, as have we, of the growing interest in museums for children, museums which are more than exhibits, museums which help the child to learn about nature more subjectively than by merely gazing at the stuffed bird in grandma's whatnot. Our readers may not be aware, however, that this movement stemmed from the work of the Children's Museum in Brooklyn, N.Y., under the guidance of our own Anna Billings Gallup, '01. Miss Gallup, who retired in October, can have a justifiable sense of pride in the present status of the work. She writes: "Although I am retired, I am getting letters every day from people in some part of the country who ask for help in starting museums for children. In a consulting capacity I am kept very busy, in spite of my purpose to retire. I shall have to buy a typewriter and learn to use it or else commandeer the talents of someone who loves children and children's museums as much as I do. I believe they will always occupy a tender spot in my heart."

Miss Gallup and her sister, Harriet, '94, were products of the stirring days in Technology life which produced also Marion Talbot, '88, professor and dean of women, emeritus, of the University of Chicago; Charlotte A. Bragg, '90, for many years head of the department of chemistry at Wellesley College; Elizabeth F. Fisher, '95, professor emeritus and former head of the department of geology at Wellesley; Katharine Blunt, '03, President of Connecticut College; and, in earlier days, the late Ellen H. Richards, '73. It was Harriet Gallup who later became the first woman chemist in the employ of the Eastman Kodak Company and who, in 1897, became the wife of Darragh de Lancey, '90, whose association with George Eastman became of such significance to the Institute and whose death, for his own sake, was mourned by us this winter.

Born of Brewster lineage on an ancestral farm in Ledyard, Conn., November 8, 1872, Anna Gallup spent her early years in a farming community. Peaceful the environment was but not sleepy. Of her mother Miss Gallup says: "She was wide awake. She liked to discuss public affairs and would start a conversation with anyone who came to the house. Every day all her life she read the *New York Times*. She was fond of travel and never missed an opportunity for it."

This alertness and largeness of view Mrs. Gallup passed on to her children, and it was her courage and perseverance that kept the family going when, while Anna was still a small child, Mr. Gallup died, leaving her with Christopher, Anna, and Harriet. While Anna went to the simple school in Ledyard, the country was still an integral part of her being. When she was 15

years old the farm was sold, and she went to California to visit relatives, returning for a two-year course in the New Britain, Conn., Normal School. There she received an honor certificate for excellence in teaching. "I was greatly surprised, for I hadn't known that I excelled." Apparently, teaching was for her a thing she liked to do and therefore did well, but we surmise that at that time she was preparing more to aid her mother with the burden of finances than to establish herself in any preconceived career.

The next three years Miss Gallup spent in charge of the model ungraded school at Hampton Normal and Agricultural Institute in Virginia, where she illustrated teaching methods to the students and was assisted by them. From here she went back to New Haven, Conn., to teach. Throughout this period Miss Gallup had dreamed of college but seldom as something attainable. There was little money available and, what is more important, she did not, herself, know what subject she wanted to pursue. The touchstone to her future was provided through the dynamic personality of a cousin-in-law who chanced to visit when he had with him a volume concerning the natural history of the frog. Biology at once presented itself to the country-bred girl as a subject she wished to explore.

With this impetus, she spent a year reviewing at the Norwich, Conn., Free Academy, and, in the following fall, entered Tech. Here she taught evening classes and supervised study halls to augment the \$125 with which she launched herself on a four-year course — the only woman in her classes. When she had been graduated, Miss Gallup went back to teaching, this time at the Rhode Island State Normal School. But she had grown to feel that "the teaching system killed spontaneous effort" and in her courses she inserted collecting trips, the making of cultures and mounts, and the use of the microscope.

At this time, 1902, the Brooklyn Institute of Arts and Sciences, under Professor Franklin W. Hooper, was seeking to enlarge its scope. Already it furnished outstanding instruction to train teachers in biology. The Children's Museum, under its guidance, occupied two rooms in the Spanish Adams House (it now fills two buildings), but the teaching methods depended upon collections and equipment which were not available in other classrooms. Professor Hooper, in his search to benefit the museum, asked the late William T. Sedgwick of M.I.T. to recommend an assistant. And so it came about that Anna Gallup, with her enthusiasm and whole-hearted interest in helping teachers and children to become acquainted with the world about them, revived the Children's Museum.

Here she spoke informally with individual children in the galleries, until her audiences grew to lecture-room proportions. She originated the plan of allowing children to take loan exhibits home, so that they might study them more thoroughly and discuss them with their friends. She found that when it was necessary to do any of the work on the scenes in the exhibition halls themselves, the children wanted to watch, and, mindful that one learns best from participation, she arranged for them to help. For the ensuing 35 years, Miss Gallup has given her energy and delight to this work, inspiring



children who have themselves grown to see successful fulfilment of the ideas she engendered. In May, 1930, the National Institute of Social Sciences presented her with its gold medal "for distinguished service to humanity as curator-in-chief of the Children's Museum for more than a quarter of a century."

Last December, Miss Gallup was recalled to Brooklyn from her newly assumed residence with her brother in Connecticut, to deliver a lecture, and on this occasion the Auxiliary of the Museum gave her a luncheon in the ballroom of The Plaza in New York City. The Review echoes the appreciation shown Miss Gallup by this group, and to her offers the best of wishes for the future.

### Visiting Committee Reports

LAST autumn a large portion of the President's annual report was devoted to the work and recommendations of the "Committees of Visitation" appointed by the Corporation for each department of the Institute. Said President Compton: "... I am most happy to pay a tribute to the very great stimulation and assistance in many ways which these visiting committees have given to the administrative officers of the Institute."

The Review, as its regular readers know, publishes in condensation most of the reports of these committees. This month the series is continued by the report of the Committee on the:

#### DEPARTMENT OF PHYSICS \*

THE Chairman laid before the Committee an itemized list of all of the investigations that were currently being conducted by the Physics Department, this list having been prepared by Professors Slater and Harrison. Various members of the Committee also visited the laboratories and inspected certain of these researches. The committee members expressed their appreciation of the skill with which certain of these investigations appeared to be conducted, and they also felt that many of them offered great promise in opening up new fields of research.

Most of the time of the Committee was devoted to the high-voltage program of the Institute. Not only did they inspect the high-voltage work being conducted at the Institute itself, but they also visited both the Collis P. Huntington Memorial Hospital, where the million-volt generator had been installed for Harvard University, and the installation at Round Hill, where the large generator there was in operation. The Committee was impressed with all this work and the able way in which it appeared to be conducted. They were informed at the hospital that the generator there had been turned over to Harvard University some two months previously, that it had been in continuous operation without any major breakdown during this time, and that, on the average, six or seven patients were being treated every day with million-volt x-rays. Thirty-one different persons had so far undergone this treatment. At Round

Hill, the Committee was impressed with the skill and perseverance of the staff, where the work has been carried on under extreme physical difficulty.

The Committee unanimously agreed to submit the following recommendations:

1. The high-voltage nuclear research program of the Institute should be continued and pushed with vigor.

2. A model generator should be constructed and used for experiments looking to improving the usefulness of electrostatic generators, with special reference to the possibility of operating such generators in pressure chambers filled with compressed air and/or compressed vapors. It is suggested that this may fit advantageously into the existing high-voltage program in the Electrical Engineering Department. . . .

### The Late Dr. Hale

BY H. M. GOODWIN

GEORGE ELLERY HALE, '90, died at Pasadena on February 21 after a long illness resulting from a nervous breakdown due to many years of intensive work. With his passing, astronomers mourn the loss of "the greatest builder of American astronomy"; the country, one of its foremost citizens; and Technology, her most distinguished son.

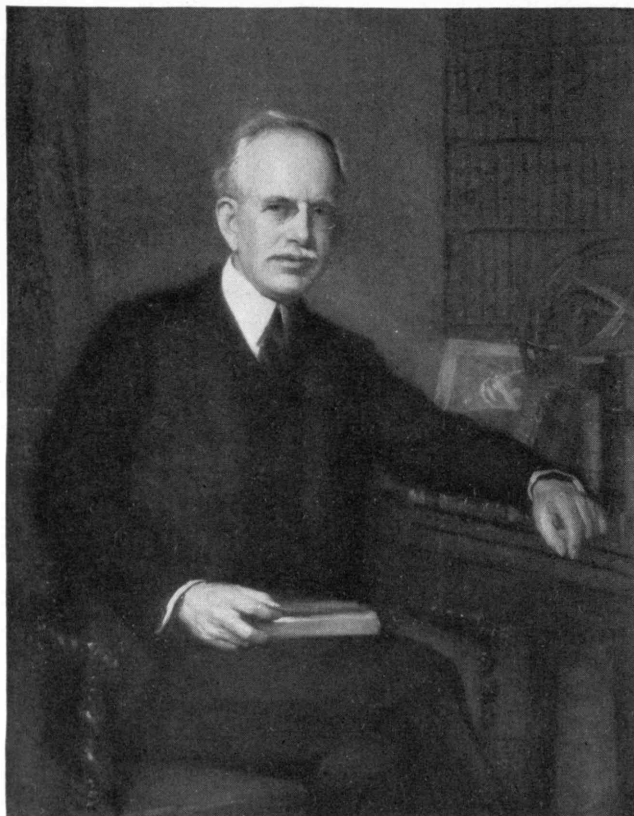
To give in the short space allotted here any adequate account of the discoveries upon which Hale's fame as a scientist rests would be quite impossible. An endeavor will be made, however, to indicate the various fields in which his extraordinary ability found expression and to convey some idea of his inspiring and lovable personality.

George Hale was born in Chicago on June 29, 1868, of New England ancestry of the finest traditions. He entered the Institute in 1886, graduating with the Class of '90 from the Course in Physics. He knew at the beginning of his college days — indeed long before — exactly what he wanted to do in life, namely, to follow a career of scientific research in astrophysics and astronomy. He was a born investigator; to experiment was for him an exciting adventure. Fortunately he had a wise and understanding father, who early recognized his unusual abilities and provided him with every facility for developing them, building for him at his home a spectroscopic laboratory and, after his graduation from Technology, the Kenwood Observatory.

While a student in his junior year, he selected as the subject of his thesis, "The Photography of the Solar Prominences," to accomplish which he invented the spectroheliograph. As the Institute had no telescope with which to form an adequate image of the sun, Professor Edward C. Pickering, director of the Harvard Observatory, placed one of his telescopes at Hale's disposal and, on April 14, 1890, the first spectroheliogram was made. The spectroheliograph has unquestionably contributed more to advance our knowledge of solar phenomena than any other invention since the time of Galileo.

Hale's ability as an investigator was immediately recognized; two years after graduation he was appointed by President Harper to the faculty of the newly founded University of Chicago. By 1895 he had established at

\*Members of this Committee for 1936-1937 were: Alfred L. Loomis, Chairman, Martin H. Eisenhart, '07, Harlow Shapley, the late Frank A. Vanderlip, Bailey Townshend, '16, William D. Coolidge, '96, Henry A. Barton, and Arthur H. Compton.



George Ellery Hale, '90 (1868-1938), from a portrait by S. Seymour Thomas hung in the National Academy of Sciences

Williams Bay, Wis., the Yerkes Observatory, with its 40-inch refractor, the largest telescope of its kind in the world. During this period he also inaugurated and edited a new journal, the present *Astrophysical Journal*. After successfully directing the work of the Yerkes Observatory for 10 years, he resigned in 1905 to take up the development of a still greater project at Pasadena, Calif., that of the Mount Wilson Observatory of the Carnegie Institution of Washington. There he built the 60-inch reflector — the mirror a gift of his father — and the great Hooker 100-inch telescope. Here, too, an entirely new type of telescope, the tower telescope, especially designed for solar work, was put into successful operation.

Finally, it was Hale, who, pointing out the possibilities of still larger telescopes, was entrusted in 1928 by the Rockefeller Foundation with the construction of the great 200-inch reflector of the California Institute of Technology, now being erected at Mount Palomar. It is a sad disappointment that he could not have lived to see this, his crowning achievement in telescope building, completed. The design and construction of novel apparatus to meet the requirements of new problems was to him a delight, and an optical shop and machine shop were considered essential.

In 1923 because of persistent ill-health, Hale felt obliged to resign the directorship of the Mount Wilson Observatory. The Carnegie Institution immediately appointed him honorary director in charge of general policy. From that time until his last illness he carried on his research work at his private solar observatory

in Pasadena, always in close coöperation with the work of the Mount Wilson Observatory.

Hale was a keen judge of men and surrounded himself with a staff of the ablest colleagues. The splendid contributions from the Yerkes and Mount Wilson observatories bear witness to the efficiency of his administration. His published papers and his annual reports reflect his modesty and desire to give the fullest credit to his associates. He was much in demand as a writer of popular science articles because of his lucid literary style, and his books dealing with various aspects of astronomy are delightful reading. Of his own contributions to astrophysics the discovery of the magnetic field in sun spots and their vortex character, the 22-year cycle of sun-spot polarity, and the general magnetic field of the sun are probably the most outstanding.

In 1902, only 12 years after his graduation, Hale was honored by election to the National Academy of Sciences. He at once became one of its most active and influential members, serving as foreign corresponding secretary for many years. He was primarily responsible for establishing the National Academy *Proceedings*. In 1916, foreseeing the probability that the United States would be drawn into the World War, he conferred with President Wilson, with the result that the academy was asked to organize the scientists of the country to assist the government in any problems which might arise. Thus was formed the National Research Council, with Hale as its first executive officer. When the United States entered the War, he gave up all scientific research and devoted himself entirely to this government service. After the War he was elected honorary chairman of the National Research Council and served also as president of the International Research Council.

Another of Hale's activities in connection with the academy was the planning of the beautiful National Academy Building in Washington, and, as chairman of the building committee, raising the money for its erection. His success in securing funds to finance the enormously expensive projects which he undertook was due to recognition of his sound judgment and confidence in his complete disinterestedness.

Hale's interests and activities were not limited to the work of his observatories and the National Academy. Believing profoundly that research in pure science is the foundation upon which applied science rests, and that in a technological school this should receive the fullest recognition, he was the leading spirit in the transformation of the Throop Polytechnic Institute of Pasadena into the California Institute of Technology. He also held that every engineer should have a broad cultural background and that, therefore, the humanities should form an essential part of an undergraduate curriculum. With these principles fully recognized as the basis upon which the new institution was to be developed, he was able to induce Robert A. Millikan, Arthur A. Noyes, '86, and later Thomas H. Morgan to head the departments of physics, chemistry, and biology, respectively, and William B. Munro that of history and government. As a member of the executive committee, he gave liberally of his time to the development of the school, now recognized as one of the leading research institutions in science.

The Huntington Library and Art Gallery of Pasadena is another institution in which Hale was greatly interested and of which he was a trustee. As a result of a plan which he suggested, Mr. Huntington modified his magnificent gift so that it became not only a great memorial but also an institution for research.

It is gratifying to know that George Hale and his work were fully appreciated during his lifetime. The number of honorary degrees conferred upon him by leading universities of the world, his membership as honorary fellow in foreign academies, the many distinguished medals presented to him, and the decorations bestowed upon him by foreign governments are indicative of the honor and esteem in which he was held throughout the scientific world. His interest and participation in public affairs was recognized in Pasadena by the presentation of a medal for his work in connection with the city planning commission. The last graceful tribute paid to Hale, which touched him deeply, was a symposium arranged by Dr. Harlow Shapley in April, 1936, and held at the Harvard Observatory. At this symposium Hale's life work was reviewed by a number of his friends and colleagues, and congratulations and sincere wishes for many years of health to continue his great work were sent to him in Pasadena.

Hale always had a deep interest in the work of his Alma Mater and served as a term member of the Corporation from 1907 to 1912. He felt, however, for many years that the importance of fundamental research in science was not sufficiently recognized. It was, therefore, a source of very great satisfaction to him in recent years to see how, under the research policy initiated by President Stratton and extended by President Compton, the Institute has forged ahead, until today it stands as one of the leading research institutions of the country. When the Institute moved to its present site, Hale contributed generously for the purchase of special apparatus for the Department of Physics; with a portion of the Hale Fund a spectrohelioscope, his most recent invention for viewing solar phenomena, was purchased with the expectation that the Institute would be able to cooperate with him in a world-wide program of keeping daily records of solar activity. Unfortunately it was found that the ground upon which the Institute rests is too unsteady for mounting this delicate instrument. The equipment is, however, very appropriately now set up in the Harvard College Observatory grounds where Hale carried out his first experiments with the spectroheliograph 48 years ago.

The foregoing sketch indicates the wide range of Hale's activities, but no words can adequately picture his personality, which inspired all who knew him and endeared him to his friends. His interests seemed boundless; he had a discriminating taste in literature, art, and music; widely traveled, his acquaintance included distinguished men the world over. Blessed with a delightful sense of humor and love of fun, he was a raconteur of rare charm and to hear him relate personal experiences to an intimate circle was an occasion never to be forgotten. The memory of George Hale, cherished by his friends, is a very happy one. Great scientist, public-spirited citizen, perfect gentleman, loyal friend: We shall not see his like again.

## SPECTACULAR FROBISHER BAY

(Continued from page 270)

comparison with Hall's map is a matter of the greatest uncertainty. Needless to say, the absence of suitable charts makes navigation in Frobisher Bay still more difficult.

Although diminutive glaciers and glacierets of the mountain type occur in the mountains of northern Labrador, the most southerly point along the eastern American shore line where a true icecap can now be seen is on the southeastern part of Baffin Island. This region, a peninsula which is bordered by Hudson Strait to the south and by Frobisher Bay to the north, is known as Kingaite by the Frobisher Bay Eskimos. Its icecaps ought to be well known, but are, on the contrary, unknown. Hall made his one visit to this section of the bay in order to ascend its perpetual ice in the vicinity of his Mount President's Seat. His brief description appears in his "Arctic Researches" (pages 516 to 521), but this seems to have escaped the attention of systematic glaciologists, and Hall's Grinnell Glacier is still unknown to them.

From Eskimo accounts, Hall was led to believe that his Grinnell Glacier extended about 100 miles along the southwest coast of Frobisher Bay. Last summer's reconnaissance, however, made it appear likely that this is much too generous an estimate; it probably extends only some 40 miles, or even less, along the bay. It was also discovered that this stretch of perpetual snow does not represent one icecap but two, between which extends a major transverse valley, filled with fluvio-glacial deposits and carrying a very important river. This unnamed drainage channel, which is joined by another unnamed river only two miles inland, empties into a very large cove, tentatively identified as the Jackman Sound of the Frobisher expeditions. Near the river inlet, the freshened waters of the cove teem with gigantic trout, about 2½ feet long.

The two icecaps are nested in radically different topography. The southeast icecap sends no glaciers down to the sea, and the coast topography therefore retains the rounded forms left by Baffin Island's earlier continental ice sheet. In sharpest contrast with this is the topography fringing the northwestern icecap. This area of inland ice sends down numerous glaciers into the bay, and these, reinforced by cirque action, have gouged deeply into the original land surface, leaving exceedingly sharp, interglacial spurs. Hall called this fretted upland the Everett Range. It rises some 2,000 to 3,000 feet directly out of the bay, and, capped by its mantle of perpetual ice, it constitutes a bit of the most rugged and picturesque topography in all of eastern North America. The razor sharpness of the spurs of the Everett Range is probably unsurpassed anywhere.

The present distribution and activity of inland ice in southern Baffin Island is interesting. It is confined to high land in the Kingaite region and is absent from the northeastern shore of Frobisher Bay, which attains heights of only about 1,000 feet. The ice is therefore conditioned primarily by elevation. Of the two Kingaite icecaps, the southeastern one is located on somewhat lower ground and is also exposed on slopes of more



southerly-facing tendency. It consequently wastes away by evaporating and melting rather rapidly, and does not spill over to form glaciers running down to the sea. Its northwestern neighbor, on the other hand, not only occupies higher ground but also is not exposed on southward-facing slopes. Its ice thus melts and evaporates less rapidly, and so accumulates and spills over to send glaciers down to the sea. The northerly-facing slopes of this region, largely shielded from the direct rays of the sun, also harbor snow slopes which develop cirques and small mountain glacierets much like those of northern Labrador. The President's Seat, a gigantic, armchair-shaped amphitheater, is an excellent example of this, and there are numerous other lesser ones.

No glaciers from this inland ice reach Hudson Strait water. This lack of glaciers on the southern slopes of Kingaita and the nonextension of the inland ice itself to Hudson Strait shores can probably be traced to the wasting of névé and ice in the sunlight of these directly illuminated, southward-facing slopes.

Some of the members of the MacMillan expedition spent a day in climbing one of the ice tongues back to the northwestern icecap. Two members (Wynne-Edwards and Edwards) climbed to the icecap by way of an adjacent rock spur. They found the height of one of the local, flat ice domes to be about 2,800 feet. Hall had measured the height of the ice as 3,500 feet next to the President's Seat — the highest region in Kingaita.

I was especially interested in the ice tongue itself and spent some time studying various aspects of it during the ascent to the icecap. This particular tongue was a relatively small one, perhaps 800 feet across and some 10 to 15 feet high where it broke off into the sea at high water. Of course, this visible height does not represent the true height of the ice front, for much of the nose of the glacier was buried in its own terminal moraine or under water. The glacier, which is about five miles long from sea to icecap, has sawed a slot for itself out of solid rock, leaving almost vertical walls hundreds of feet high. The talus from these steep sides is continually being removed to the sea in the form of lateral moraine.

The approach to the glacier was characterized by a milky sea, an indication of the load of rock flour which is produced by the grinding action of the ice. Out of the ice front poured a stream of water into a puddle in the terminal moraine, a picture reminiscent of the horse drinking troughs of former days. The ice front itself was very interesting. It was composed of a compact mosaic of grains averaging about walnut size but ranging up to, perhaps, two inches across. Each grain was a true, single ice crystal, proof of which was supplied by the swarms of flat air inclusions, all with flat sides parallel.

The glacier ice is strikingly colored. In addition to the neutral ice color, streaks and areas of the most intense but somewhat pale blue occur. Such areas probably represent healed crevasses and new ice generally. This beautiful blue tint is also found in the small icebergs formed from the local glaciers.

Much of the glacier surface is dotted with tiny rock particles, blown there from the talus piles by the strong wind. These particles absorb the sun's heat and melt the ice beneath themselves to form holes, into which they sink. The black particle at the bottom of each hole

makes the hole appear to open into nothingness, and the area gives the impression of a thin crust of honey-combed, rotten ice which might crush through to an interior cavern under one's step. The footing is, of course, quite sound.

No important central crevasses occur in the tongue except where it originates as an ice stream spilling over from the icecap. The central crevasses here are cracks due to the sharp, downward bend in the ice at this initial drop. Below this position the ice takes on a rather uniform, steep slope, and the central crevasses close up and heal. New crevasses occur only along the sides, where diagonal tension cracks develop. These point backwards toward the center of the glacier, giving evidence that the central ice moves faster than the ice near the walls.

The MacMillan parties climbed the glacier on July 29. At this season the surface was running with water which gathered itself together into streams. These ordinarily disappeared by dropping into the side crevasses, but near the foot of the glacier, where no crevasses occurred because of lack of walls to slow down the side ice, swift streams of considerable erosive power developed and entrenched themselves in small ice valleys which were impossible to cross.

The icecap from which the glaciers descend is a gently domed surface whose steepest regions slope only a few hundred feet per mile. It is entirely covered with a deep mantle of granular snow. Into this, one sinks knee-deep, making traveling very tiresome. The ice itself is visible only in one or two steep, wind-swept places near the edge of the ice field, where dull, grayish ice projects from its snowy mantle. The word "wind-swept" is used advisedly, for the heavy, ice-chilled air pours down the ice tongue surface with great velocity, pushing against anyone making an ascent.

There are many indications in the Frobisher Bay region that the present icecaps are only diminutive representatives of a great ice sheet which once not only covered Baffin Island but also extended out into the sea surrounding the land, like the present-day Ross Barrier of the antarctic regions. The northeastern shore of Frobisher Bay displays the rounded land forms characteristic of heavily glaciated regions, and many of the inlets along this shore are typical fiords. While glacial striae are uncommon, due to the rapid arctic weathering, *roches moutonnées* occur on the highest mountains, evidences of the glacial plucking which they have received. The ice came mainly from the northeasterly direction, following to a considerable extent the line of strike of the metamorphosed sedimentary rocks, but occasionally cutting across this from a more northerly direction. The ice certainly extended out beyond the land mass of Baffin Island as far as Resolution Island, which shows an extreme case of glacial plucking from the same general direction. Some 20 miles of deep sea separate Resolution Island from the Baffin Island land mass, and this gulf must have been spanned by a fringe of continental ice.

The great weight of the Pleistocene ice in Baffin Island indented the somewhat yielding crust of the earth. At the close of the Ice Age, the melting of the ice sheet and the consequent decrease of the enormous ice load permitted the land to recover slowly (*Continued on page 282*)



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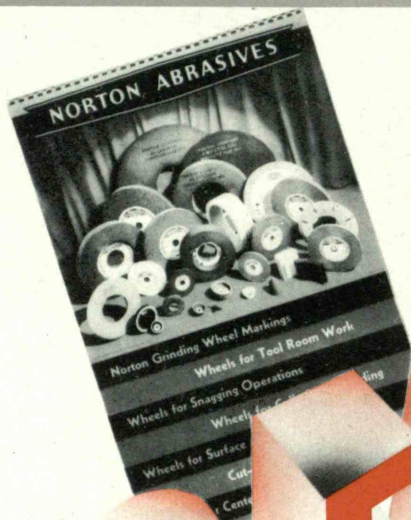
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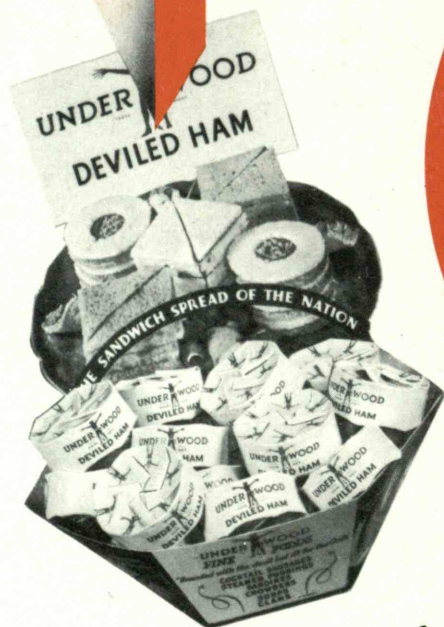
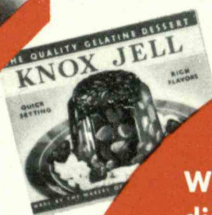
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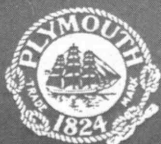


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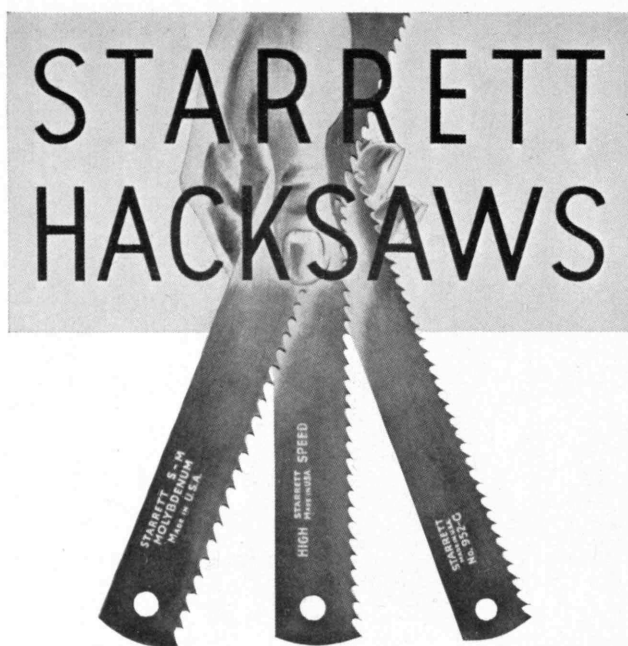
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## SPECTACULAR FROBISHER BAY

(Continued from page 280)

its normal level, and Baffin Island started to emerge from the sea, a process which added somewhat to its land area. The story of this emergence is neatly outlined on certain of the islands of Frobisher Bay. Kodlunarn Island, for example, the scene of Martin Frobisher's "gold" mining operations, has a surface marked by a succession of gravel and shingle beaches up to its very top, now 55 feet above high tide. Each of these represents a stage in the shore line of the island at an earlier period of its history. The island has certainly emerged at least 55 feet out of the sea, but this is not a measure of the total emergence of the entire area, for the island was doubtless under water during the earlier stages of the rise of the region from the sea. The river entering Jackman Sound (?) on the Kingaita side of the bay gives a better idea of the total rise. This river once meandered over an outwash plain common to the two icecaps which it separates. The outwash plain now stands some 180 feet above high tide, and the river has entrenched its meanders nearly down to sea level. Since the river probably always emptied directly into the sea, and since it once ran over the surface of its now elevated outwash plain, this 180-foot difference between its old and new levels probably gives a good estimate of the rise of the Kingaita coast out of the sea.

The 1937 expedition encountered no Eskimo inhabitants on the rugged Kingaita shore, although Frobisher's expedition found them in the vicinity of Jackman Sound in 1577. On the less severe northeastern coast, however, two very small settlements were found, one at Brewster Point, and the other near Wiswell's Inlet.

The Frobisher Bay Eskimos are nomads: They have no definite home but follow the seals and walruses from place to place. During the summer season they live in tents made either of sealskins sewn together or, perhaps, of canvas if they have been fortunate enough to obtain some by trading. The Brewster Point Eskimos had a couple of old whaleboats which, it was learned, were recovered from arctic wrecks. They also use the usual sealskin kayaks (which have a very strong odor because they are rendered waterproof with the all-purpose seal oil).

These Eskimos, in common with other branches of their race, are incredibly dirty according to our standards. Nevertheless, the women have a sense of fashion, for they own two dickeys (the eastern equivalent of the Alaskan parkas). One of these is usually made of the Hudson's Bay Company's duffel, which is blanketing sold by the yard. This dickey becomes extremely dirty through everyday wear. The second dickey is used mainly on visiting occasions and is a work of art in sealskin. Even the Eskimo women have an eye for good furs, and the best skins — those from the ranger seals found in fresh-water inlets — are used for their dickeys. They are laboriously pieced with strips of black fur to give an inlaid effect of great beauty, the pattern of which is a characteristic of the district. In accordance with tradition, a woman's dickey is always made with a long tail. Legend has it that a polar bear once attacked a woman, mistaking her for a (Concluded on page 284)

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## SPECTACULAR FROBISHER BAY

(Concluded from page 282)

man, and since that time women have distinguished themselves for the benefit of the bears by wearing dickeys with tails. It is said that the bears respect this sign and confine their attentions entirely to men. The men of southern Baffin Land get along with very simple dickeys made of common sealskin far inferior in quality to that used by the women. They are without tails but have the characteristic regional peculiarity of a V-shaped slot cut out of the bottom front.

With these interesting people, with its magnificent scenery and great icecaps, with its challenging unknowns and geologic interest, Frobisher Bay deserves both scientific exploration and sight-seeing excursions. I hope that both will be made.

## MAIL RETURNS

(Concluded from page 252)

such a particle under the microscope, using an instrument known as the micromanipulator. What really is new in Dr. Kemp's excellent work is the assumption that the hydrocarbon in the inside of the particle has water emulsified therein. However, as he himself says, "Further study of latex particles is needed to answer this question." (Quoted from Dr. Kemp's paper, *op. cit.*)

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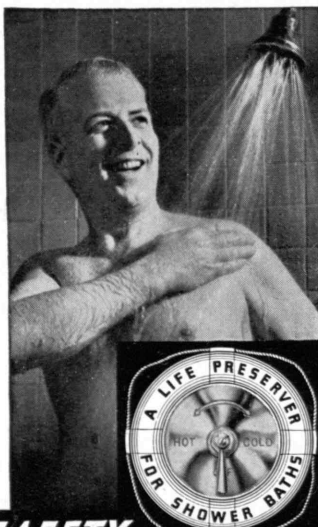
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## THERE ARE GOOD GERMICIDES

(Continued from page 272)

chlorine, phenol, acids, spices, antiseptic oils, and other substances as disinfectants was known previous to this period, but very little knowledge was available concerning the actual value of some of these agents. The production of new compounds with high germicidal potency and relatively low toxicity marks the very modern era of chemical disinfection. Phenol coefficients of from 200 to 800 are now not uncommon. To illustrate: The compound, alkyl-dimethyl-benzyl-ammonium chloride, has a phenol coefficient of 400 when tested against *Staphylococcus aureus* and 570 when a strain of *Streptococcus haemolyticus* is used as the test organism at 37 degrees C. A phenol coefficient of 750 has been obtained with 3,5-dimethyl-2-benzyl-4-chloro-phenol, using *Staphylococcus aureus* at the same temperature. By changing the structure and chemical constitution of compounds, it has been possible to bring about very favorable results. Mercuric chloride, though a good germicide in some respects, is extremely poisonous. Its use is not without certain dangers, especially in the home. Merthiolate is a mercurial but is not nearly so toxic as mercuric chloride and is a far better germicide. Another mercurial, metaphen, is also more powerful than mercuric chloride as a germicide and at the same time is said to be relatively non-toxic. A 1/1,000 aqueous dilution of alkyl-dimethyl-benzyl-ammonium chloride has been substituted for drinking water for laboratory animals without observable ill effect to the animals. Were it not for selectivity of action toward different types of cells, these unusual results would not be possible. The chemical agent must possess a high degree of toxicity for microorganisms but simultaneously have relatively low toxicity or irritative action toward the tissues of animals.

If, in addition to possessing high germicidal efficacy, a substance possesses also strong inhibitory properties (bacteriostasis), it is of distinct advantage, since reinfection is retarded. Most mercurials inhibit the development of certain bacteria, in particular *Staphylococcus aureus*. Metaphen, merthiolate, phenylmercuric nitrate, mercuric chloride, o-hydroxyphenyl-mercuric chloride, and mercurochrome are examples of this group of antiseptics. The last is much more effective in an alcohol solution than in water. Chlorine-liberating compounds usually demonstrate inhibitory action toward some types of microorganisms. Alkyl-dimethyl-benzyl-ammonium chlorides have demonstrated a high degree of bacteriostasis toward some Gram-positive bacteria. (Bacteria may in general be divided into two large groups: Gram-positive and Gram-negative bacteria, depending upon their reactions to certain staining reagents.)

Since the research of Churchman in 1912 and subsequent years, much attention has been focused on the use of dyes in medicine and in the laboratory to inhibit the growth of undesirable types of bacteria, while having but little effect on certain desirable microorganisms. Specificity of action is thus a most important characteristic of the dye. There are three main groups of dyes which are useful on account of their ability to inhibit or prevent growth of microorganisms. These include the triphenylmethane, or rosaniline, (Continued on page 286)



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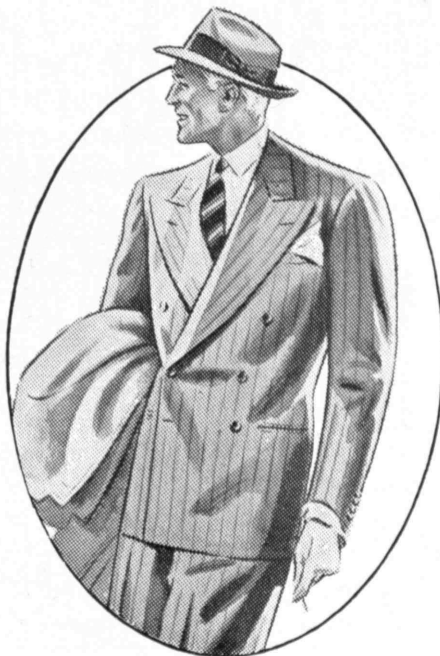
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## THERE ARE GOOD GERMICIDES

(Continued from page 284)

dyes, the acridine dyes, and the fluorescein dyes. Gentian violet, crystal violet, methyl violet (all closely related), and fuchsin are well-known members of the triphenyl-methane dyes. Some of these dyes are capable of inhibiting the growth of Gram-positive bacteria when diluted several million times. Gentian violet has shown value in the treatment of wounds and burns, while brilliant green, another member of this group, is used in the sanitary analysis of water. Acriflavine hydrochloride (acriflavine), acriflavine base, and proflavine are bacteriostatic agents of worth. Their action is considerably reduced by the presence of blood serum, however. Mercurochrome is a well-known example of the fluorescein dyes which are used in medicine.

Garrod and others have shown clearly that the maximum dilution of the chemical substance at which inhibition takes place is dependent on the concentration of microorganisms present. For example, a concentration of one part of phenylmercuric nitrate in 1,280,000 parts of solution prevented the cocci which were present in 0.1 cubic centimeter of an undiluted culture of *Staphylococcus aureus* from growing (there are several million bacteria present in 0.1 cubic centimeter of a broth culture), while one part of chemical in over 20,000,000 parts of solution prevented growth when there were only about 400 bacteria present.

Many of the failures resultant from the use of chemical germicides could be prevented if the persons using them had a more extensive knowledge of their purposes and limitations. There are certain dangers which may be encountered in the use of germicides. These may be due to the fact that the agent possesses high toxicity; or it may be ineffective in the presence of organic matter; or it may demonstrate specificity of action. Dangers may also result from the preparation of a solution of the chemical substance with the wrong type of solvent or the failure of the substance to make contact with the desired site. The agent may even stimulate the growth of some of the types of microorganisms which it is designed to destroy.

Some germicides possess high bactericidal potency but, due to their high toxicity, are valueless as germicides for use on the skin, in wounds, or for other medicinal purposes. All germicides, whether powerful or weak, usually have some toxic effect upon tissues. It is necessary, therefore, to determine what concentration of the chemical agent can be safely employed. This may be accomplished by experimentation with animals, such as rats, mice, guinea pigs, rabbits, monkeys, or by tests carried out on man. Tests with human subjects are advocated wherever possible. Clinical evidence from not one but hundreds or even thousands of cases is to be sought. Some of the mercurials have limited solubilities or are far too toxic, if used in concentrated solution, for medical purposes.

From careful laboratory and clinical tests, there should be made a determination of the range of permissible concentrations of a substance. On the one hand, the substance must be sufficiently strong to destroy germs under the conditions of its use, and on the other



hand, it must be of such dilution that undue injury will not be done to the tissues. The primary purpose of the chemical agent is to destroy any pathogens which may be present and to prevent reinfection. If it fails to do these things or if it actually destroys tissue or prevents normal healing processes from taking place, then it is without value and it may even be dangerous. Phenol, for example, is a powerful germicide, but it is very toxic to tissues. Its use, accordingly, must be confined to other types of disinfection, such as the disinfecting of stables. Laboratory tests have proved of great value in determining the effect of organic matter on germicides. The organic matter employed may include blood, saliva, urine, fecal material, agar, starches, gelatin, or yeast cells, depending upon the use to be made of the germicide. Many compounds now on the market, and labeled germicides, are ineffective in the presence of only ten per cent blood serum. Hypochlorites and many mercurials are reduced considerably in efficacy in the presence of organic matter.

Throat gargles are a popular commercial product, yet an ideally successful germicidal mouthwash has probably never been produced. This is a field for productive research. Innumerable crypts exist in the mouth and throat into which the wash probably never penetrates. Membranes are sensitive and easily injured by harsh compounds. Saliva, bits of food between the teeth, and other organic matter combine with the gargle, increasing its volume and thus reducing the concentration of the active principle. But what about the time allowed for the gargle to act upon the bacteria? The average person usually takes less than 20 seconds for the act of gargling. In order to destroy most of the bacteria under the conditions existing in the mouth in the short space of a few seconds, a very powerful germicide would be necessary. How much less effective are the pleasant-tasting, fragrant "antiseptics" which are so highly advertised!

It was pointed out in the foregoing paragraphs that high dilutions of some dyes and chemical substances may prevent certain bacteria from growing. Specificity of germicidal action may also become a factor of considerable importance, and the possession of especially high potency toward certain organisms may result in the use of the substance for specific purposes. For example, some agents have particular value as fungicides, as for the treatment of athlete's foot. Some unsaturated soaps, as, for example, sodium oleate, linolate, linolenate, and chipanadonate, have demonstrated specific action towards pneumococci. Silver nitrate (one per cent) is used as a prophylactic agent in the eyes of new-born infants to prevent gonorrheal blindness. On the other hand, a substance possessing marked specificity of action may fail to be of service as a general disinfectant, on account of the fact that its efficacy toward some pathogens may be of very low order.

Some good germicides have been prepared by combining two different chemical agents — one demonstrating high potency principally toward Gram-positive organisms and the other showing high potency toward Gram-negative organisms. One such combination is mer cresin — a compound containing o-hydroxyphenyl-mercuric chloride and secondary amytriciresols.

Microorganisms frequently (*Continued on page 288*)

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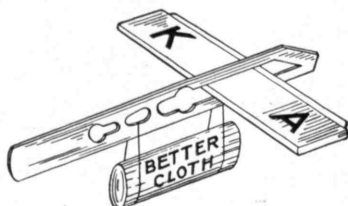
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## THERE ARE GOOD GERMICIDES

(Continued from page 287)

vary considerably in their resistance to chemical substances. Bacterial spores are oftentimes extremely resistant to chemical agents; yet it is necessary in disinfection to destroy the spores as well as the vegetative forms of microorganisms. Five per cent phenol does not destroy the spores of *Bacillus subtilis* in 25 hours at 37 degrees C. Some of the popular market antiseptics likewise have very little effect on bacterial spores. One highly advertised and popular antiseptic did not destroy *B. subtilis* in one day. How can one expect wonders of such products, when oftentimes they are permitted contact with the body for only a few seconds!

In view of the wide variations in the resistances of microorganisms, the futility of rating the value of a disinfectant on the basis of one measurement, where only one organism, one temperature, and no added organic matter is used, is apparent.

The use of the proper vehicle for a germicidal substance is of great importance, for a vehicle may either enhance, reduce, or have no effect on the germicidal value of the agent. The selection of the vehicle is a matter which requires careful study—*pH*, solubility, surface tension, and toxicity are some of the factors to be considered in this choice.

Though a substance may demonstrate remarkable results in the test tube, if it lacks the ability to penetrate matter or reach the desired site, it has no value as a germicide. The physician may wish to know whether some particular agent will penetrate oil, or grease, or dried blood. The man in industry may wish information concerning the application of a substance in connection with foods or beverages. The research man must determine these facts if they are not already known.

While not a problem of large magnitude, the question of stimulated growth is one which should be adequately considered in the use of any agent in, or on the surface of, the body. A germicide may be used in such small dilution that, instead of destroying bacteria, it may actually stimulate their growth. Although it has been known for years that minute amounts of poison may act as cell stimulants, the possible application of the Arndt-Schulz law to disinfection has not been considered seriously until quite recently. One objection to present-day methods of evaluating germicidal substances is that the conditions simulated are not identical with those associated with the animal body. Although this objection is based on reason, there are sufficient yardsticks to measure satisfactorily the efficacy of a substance. No one method is sufficient in itself and there are many ways in which improvements may be made in those already existing. One of the recently suggested methods for evaluating a germicide or anti- (Concluded on page 290)

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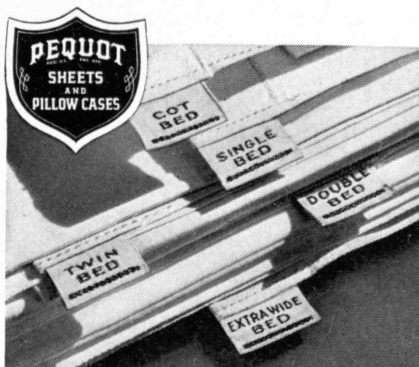
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## THERE ARE GOOD GERMICIDES

(Concluded from page 288)

septic depends upon ascertaining the effect of the substance on living embryonic tissue — toxicity as well as germicidal action being estimated.

Contrary to some prevalent ideas, there is still much to be done in the field of disinfection. There is need, first of all, for highly skilled men, who have had a basic training in biology and chemistry with special emphasis on microbiology, organic chemistry, biochemistry, and histology. Even closer contact of members of the medical profession with the manufacturer and the research man would be beneficial where the agent is designed for medical uses. Methods of evaluation could be improved, new methods developed. The production of new substances with high germicidal efficacy, combining healing properties with extremely low or negligible toxicity, is always to be sought. Control of advertising is urgent to protect the public. The radio could also be used to a greater extent in educating the public on the subject.

Chemotherapy is a field of science closely related to chemical disinfection. By chemotherapy [see the article by Tenney L. Davis on page 273] is meant the treatment of disease by chemical compounds that have a marked degree of specificity and selective action toward the microorganisms causing the disease but which do not injure the tissues.

Compounds several times as powerful as the well-known sulfanilamide have now been developed and have been used successfully to treat mice having streptococcal infections.

In respect to disease and infection, the human race has indeed a brighter future to face than the man of a few generations ago. Progress has not become impeded but stimulated to a high degree. Some day man may be able to prevent disease by the administration of pure chemical compounds.



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# TECHNOLOGY MEN IN ACTION

CHECK LIST OF THE ACTIVITIES AND ACHIEVEMENTS OF M.I.T. ALUMNI, OFFICERS, AND STUDENTS

## *Elections, Appointments, Promotions*

¶ WILFORD W. DE BERARD '01, associate editor, *Engineering News-Record*, became a director of the American Society of Civil Engineers in January, for a two-year term.

¶ JAMES J. MAHAR '02, engineer in the Boston school department, became superintendent of construction in the Boston department of school buildings in March. Mr. Mahar succeeds WILLIAM W. DRUMMEY '16, who is retiring after having "served under three mayors and expended more than \$15,000,000 of city funds without criticism from the finance commission."

¶ EMORY S. LAND '06, rear admiral in the United States Navy, became chairman of the United States Maritime Commission in February.

¶ GEORGE J. MEAD '16, Vice-President of the United Aircraft Corporation, became vice-president of the Institute of the Aeronautical Sciences in January. At the same meeting, LESTER D. GARDNER '98 was reelected secretary and THEODORE P. WRIGHT '18, Vice-President in Charge of Engineering of the Curtiss-Wright Corporation, became president of this group.

¶ EDWARD PENNELL BROOKS '17, supervisor of departments handling radios and accessories and dairy and power equipment, Sears, Roebuck and Company, became factory manager of this company in February.

¶ EDWIN S. BURDELL '20, Dean of Humanities at M.I.T., appointed director of the Cooper Union for Advancement of Science and Art, New York City, beginning in the fall.

## *Outstanding*

¶ JOHN B. WILBUR '26, Associate Professor of Civil Engineering, awarded the prize of the designer's section of the Boston Society of Civil Engineers for the best paper presented to the section during the past year: "Model Analysis of Structures." The award was made on March 16.

¶ ERVIN H. BRAMHALL '27, physicist and member of the faculty of the University of Alaska, presented with a congressional medal for his part in the exploration of the Antarctic

with Rear Admiral Byrd in 1933 and 1934. RAYMOND J. BARBER '06, dean of the school of mines at that university, attended the presentation ceremony in January.

¶ JOHN G. KIRKWOOD '29, 1936 recipient of the American Chemical Society Award in pure chemistry, named first incumbent of the Todd professorship of chemistry at Cornell University, assuming his duties in September.

## *Written*

¶ By CHARLES B. BREED '97 (and the late GEORGE L. HOSMER '97), "Principles and Practice of Surveying," in two volumes, seventh edition of Volume I and fifth edition of Volume II, John Wiley. "The entire volume [I] has been thoroughly reviewed, and no pains have been spared to make the book as perfect as possible. Numerous problems have been added to nearly every chapter." Volume II has also been changed extensively.

¶ By WARREN K. LEWIS '05, WILLIAM H. MCADAMS '17, EDWIN R. GILLILAND '33 (and the late WILLIAM H. WALKER, Staff), a third edition of the famous text that has so influenced teaching in its field: "Principles of Chemical Engineering," McGraw-Hill. "Throughout this revised edition, emphasis is laid on the importance of material and energy balances, equilibria, and rate relationships, and the technique of using these in solving practical problems."

¶ By J. SPOTTS McDOWELL '16, "Modern Refractories in the Steel Plant," *Blast Furnace and Steel Plant*, January. This article is a review "devoted mainly to a discussion of trends which have been noted in preceding years, but which recently have become more pronounced. . . . Among the more significant developments . . . are improvement in the manufacture and extension in the use of chemically bonded magnesite brick . . . of forsterite brick, and of magnesia bonded chrome brick."

¶ By IRVING FINEMAN '17, "Dr. Addams," a novel, Covici, Friede. "Its basic theme is the relation of the scientist to the society he serves."

¶ By AVERY A. MORTON '24, "Laboratory Technique in Organic Chemistry," McGraw-Hill. Among other

topics the reader is "introduced to vacuum technique and to molecular stills, is made acquainted with all types of still distillation, and is instructed in the methods of filtration, decoloration, and chromatographic adsorption."

¶ By THOMAS K. SHERWOOD '24, "Absorption and Extraction," McGraw-Hill. In addition to gas-absorption equipment data and the principles of solvent extraction, "this book deals with the theoretical aspects of diffusion . . . presents the important relations derived from the kinetic theory . . . and includes tables of previously unpublished equilibrium data derived from the Lewis fugacity charts."

¶ By JERVIS C. WEBB '37, "Conveyors Expedite Goods in Process," *The Tool Engineer*, January. This article was written to provide the answer for: "What is the optimum volume per given plant and product?—where can we eliminate waste effort?—how can we conserve space?"

¶ By ERNEST H. HUNTRESS, Staff, "A Brief Introduction to the Use of Beilstein's *Handbuch der Organischen Chemie*," second edition, John Wiley. This edition includes material which was not available when the first edition appeared.

## DEATHS

\* Mentioned in class notes.

¶ FRANK L. SMITH '79, February 10.  
¶ FREDERIC HALL '89, February 3.\*  
¶ ROBERT C. WILLIAMS '89, July 12.  
¶ GEORGE E. HALE '90, February 21.  
¶ ALLEN H. ROGERS '90, February 14.  
¶ GEORGE CHAPIN '92, February 19.  
¶ DALTON PARMLY '93, January 16.  
¶ MARY B. BULLARD '94, June 11.  
¶ JOHN RATHBONE '95, February 19.  
¶ INGERSOLL BOWDITCH '00, February 11.\*  
¶ CARL HUMPHREY '05, February 7.  
¶ DONALD CORNISH '12, February 6.\*  
¶ LAWRENCE L. TRAVIS '15, date not known.  
¶ HENRY J. BRUNO '19, February 14.  
¶ WALTER DRISCOLL '22, January 30.\*  
¶ JOHN REARDON '23, September 1.  
¶ JOHN O. SUMNER, Former Staff, February 20. Professor Sumner taught at Technology from 1894 to 1933.

# NEWS FROM THE CLUBS AND CLASSES

## CLUB NOTES

### *Technology Club of Bridgeport*

The Club held a buffet supper and meeting at the local University Club on February 2. George Owen '94 was the guest of the evening and, as usual, he proved to be a popular drawing card. Professor Owen gave an informal talk on the high lights of last season's yachting, which he accompanied by motion pictures in color.

Forty-two Alumni turned out for the meeting, which was presided over by President Humphreys '95. In addition to Professor Owen, the Club had as its guests eight young men who are now in attendance at Tech and their fathers. The students who helped make this first father-and-son night an outstanding success were John Wheale '38, Robert Pratt '39, Julius Lucas '40, Albert Margenot '41, Douglas Watson '41, Richard Christie '39, Frank Langhammer, Jr., '41, and Don Waterman '39. It is intended that meetings of this sort shall become an annual affair. — ERNEST J. A. GREENWOOD, JR., '34, *Secretary*, 2048 Elm Street, Stratford, Conn.

### *M.I.T. Association of Cleveland*

About 40 members attended the annual meeting of the Association on Friday evening, January 21. Reports of officers and committee chairmen were received, and a new constitution for the Association was adopted in record time, with none of the wrangling that characterizes most present-day discussions of constitutional questions.

The following officers were elected: President, Tyler W. Carlisle '10; Vice-President, Willard G. Loesch '21; Secretary, Wm. Crighton Sessions '26; Treasurer, George E. Merryweather '34; Executive Committee: John A. Bradner '35, John W. Church '22, H. Seymour Colton '21, Harry E. Essley, Jr., '36, Allen A. Gould '10, and Erle F. Whitney '07. At the conclusion of the business meeting we enjoyed a most interesting talk by Dr. Zay Jeffries on "The Metallic Vitamins." — WM. CRIGHTON SESSIONS '26, *Secretary*, Richey and Watts, 1150 Union Trust Building, Cleveland, Ohio.

### *Engineering Association of Hawaii*

This group, of which William C. Furer '06 is secretary, held a meeting with a Technology flavor on January 28. John J. Thomas '07, district superintendent of the American Can Company in San Francisco, addressed the group, speaking of a recent visit of Treasurer Ford to the West Coast in the interests of the \$1,650,000 Fund Drive for new gymnasium facilities and sketching the history of the Ameri-

can canning industry (see *The Review*, December, page 71). In addition to Messrs. Furer and Thomas, the Tech men present at this meeting included two of the three Patches: Dan '02, who had arrived that very morning from the mainland, and Ernest '10, who is stationed in Hawaii as commander in the construction corps, United States Navy.

### *Technology Club of South Florida*

Dr. Compton enjoyed his short visit to Miami, and we greatly appreciated having him and Mrs. Compton as our guests. The January 25 meeting was a success, and 28 of our members joined with 112 others in making the occasion memorable. We may all take pride in the knowledge that our Club made possible the foregathering of many engineers and their friends to meet Dr. Compton. Approximately 25 per cent of the company were women, and their interest in Dr. Compton's remarks matched that of the men.

The consuls of several of the Spanish-American countries were present. Charles F. Kettering, Vice-President of General Motors Corporation, an old friend of Dr. Compton's, spent a few minutes with us before dinner was served. Leo Hendrik Baekelund, well known in the engineering field as the inventor of Bakelite, B. F. Ashe, President of Miami University, and James J. Marshall offered brief remarks from the speakers' table, welcoming Dr. Compton, and each told something of the contributions made to science and engineering by the President of M.I.T. So we round out the first year of our informal organization of the Club. — CLARENCE P. THAYER '23, *Secretary*, 1760 Northwest 41st Street, Miami, Fla.

### *M.I.T. Club of Northern New Jersey*

Now for that annual banquet which will be held in the main dining room of the Newark Athletic Club on Thursday, April 7: Bill Coleman '24 has cooked up an exciting technical-exhibition dish; also in his capacity as chairman of the evening's program committee he is offering splendid speakers, including the Institute's B. Alden Thresher '20. William J. Orchard '11 will be the toastmaster. All Alumni within reasonable distance from the city of Newark are cordially invited to come to this party (informal). Press news just telegraphed (February 26): "Coleman technical dish referred to is a talk and illustration of television by the authority, Allen B. Dumont, President of Allen B. Dumont, Inc., Upper Montclair, N.J."

Apropos of the smoker held on February 9, the fact is here recorded that, in spite of rain which influenced some stay-at-homes, 148 members evidently enjoyed

the hours they spent in Duffield Hall, and 56 out of the total number exercised the privilege which was extended to dine at the Newark Athletic Club preceding the main meeting. On the mark, at 8:30 P.M., President Vilett '22 drew the microphone forward and operated a rapid and informative business session concerned with northern New Jersey's affairs. Responsible individuals who presented high lights about the club activities with which they are charged gave proof in their presentations that Alumni in this territory efficiently foster the traditions pertaining to solid growth which were established four years ago for this Jersey offspring.

The mike was next placed before N. McL. Sage '13, who made an interesting exposition of the Institute's Placement Bureau, of which he is the head. After covering the work of his department, he described the technique of interviewers and offered suggestions as to the desirable details for position applicants to furnish or emphasize. He also touched upon trends in employment and was, consequently, busy answering questions during available time thereafter. Then came A. A. Nichoson, personnel director of The Texas Company, with his survey of human relations in business. This speaker speculated forcefully about employment effects of new-type legislation emanating from Washington and gave his views about the responsibility of industry toward behaviorism of the worker and the educational need, on the worker's part, regarding the philosophy of business. As a measure of the interest in this kindred subject, he likewise was surrounded by a group of questioners until closing time.

Entertainment by "Charlie the mystifier," a collation, a meeting of friends, old and new — finally the clock's admonition to break up another worthwhile time. . . . *Obiter dictum*: Mail the pledge card to Cambridge! — A. RAYMOND BROOKS '17, *Secretary*, Wayside, Brantwood, Short Hills, N. J. FREEMAN B. HUDSON '34, *Assistant Secretary*, Colgate-Palmolive-Peet Company, 105 Hudson Street, Jersey City, N. J.

### *Technology Club of Central Florida*

On January 20 the Club held a meeting at the new Bath Club near Maderia Beach, at which our St. Petersburg members acted as hosts. After the dinner, the meeting was mostly given over to discussion of the Alumni Fund Drive to build a new gymnasium.

The following members and guests were present at the meeting: William T. Leman '73, St. Petersburg; Harvey M. Mansfield '83, Tampa; Theodore H. Skinner '92, Clearwater; Albert W. Higgins



'01, St. Petersburg; William H. Leathers '03, Sarasota; Albert N. Morton '04, Dunedin; Walter N. Munroe '06, Sarasota; Franklin O. Adams '07, Tampa; James J. R. Bristow '14, Safety Harbor; Fred D. Mendenhall '14, Tampa; Malcolm R. McKinley '19, Tampa; J. Allen Weaver '23, Lake Wales; Herbert W. Booth '25, Sarasota; F. R. Francke, Princeton '06, St. Petersburg; S. Murray Jones '21, New York; A. G. Olsen, University of Minnesota, Battle Creek, Mich. — MALCOLM R. MCKINLEY '19, Secretary, Tampa Electric Company, Tampa, Fla.

### *Washington Society of the M.I.T.*

The Society held its monthly luncheon meeting on February 18 at the Cosmos Club. Charles P. Kerr '11 officiated as chairman, in the capacity of acting president of the Society. Charles G. Abbot '94, Secretary of the Smithsonian Institution, was among those who were called upon to express the sentiments of the entire group in memorializing our beloved President, Harry Walter Tyler '84. The following resolution of condolence was passed: "With feelings of deepest regret, the Washington Society of the M.I.T. records the passing of its most beloved and distinguished member, our President, Dr. Harry Walter Tyler, who died on February 2. Because of our deep appreciation for the many and long years of service rendered by our beloved President, not only to our Society but to the undergraduates and Alumni of the M.I.T. as well, and because of the sincere love inspired in all of our hearts by his kindly, unselfish life of service; be it

*"Resolved,* That we inscribe upon our records this tribute to his memory, that future generations shall be reminded of his exemplary character, his friendly humor, his untiring devotion to every duty pertaining to Institute affairs, and the respect and love which he implanted deep in the heart of every Tech man who knew him; and

*"Resolved,* That one copy of these resolutions be forwarded to The Review and a copy also be transmitted to the family of our deceased President, together with our heartfelt sympathy for them in their great loss."

William C. Johnstone, associate professor of political science at George Washington University, addressed the group on the subject: "The Stakes of War in the Far East." He presented most interestingly the manner in which events leading up to present hostilities have revolved around Japan's policies and purposes. Tswen-Ling Tsui, second secretary of the Chinese embassy, was among the guests who attended the meeting.

The following Alumni and other guests were present: George W. Stose '93, Minor S. Jameson, Jr., '34, Perry R. Taylor '21, Frederick E. Fowle '94, Frederick W. Swanton '90, Harrison W. Flickinger '10, Elijah Levi '17, George W. Stone '89, Louis H. Tripp '06, Henry M. Loomis '97, Stephen G. Henry '24, Arne H. Ronka '23,

Joseph C. Dorr '09, Stanley C. Sears '01, Walter L. Cook '03, Charles Bittinger '01, Christopher W. Duffy '20, Ernest W. Hunter, guest, Louis J. Grayson '19, Lieutenant Colonel Batton, guest, William K. MacMahon '22, Robert K. Thulman '22, George A. Nichols '95, Max C. Mason '12, Edward T. Steel '05, Ben E. Lindsly '05, John C. Damon '05, Earl B. Snell, guest, Edward P. Roll, Jr., '23, Allen Pope '07, Frederick A. Hunnewell '97, Henry D. Randall, Jr., '31, Lawrence W. Conant '21, T. L. Tsui, guest, Charles P. Kerr '11, W. C. Johnstone, guest, Charles G. Abbot '94, William D. Rowe '24, Proctor L. Dougherty '97, John A. Plugge '29, George R. Hopkins '22, Horace E. Weihmiller '25, Walter I. Swanton '93, Benjamin F. Thomas, Jr., '13, William C. Mehaffey '17, Thomas M. Roberts '98, Harry B. Swett '25, Amasa M. Holcombe '04, Merton L. Emerson '04, William A. Sullivan '17, William B. Poland '90, and Paul Weeks '02. — LAWRENCE W. CONANT '21, *Review Secretary*, 3008 Ordway Street, Northwest, Washington, D. C.

## CLASS NOTES

### 1875

It is the sad duty of your Secretary to record the death of one of the most devoted and loyal members of the Class. He doubts whether anyone attended more of our meetings and outings than Mr. Dorr, since the class organization was rejuvenated in 1882. Edgar S. Dorr died of pneumonia following a fall, October 5, at the Boston City Hospital. He was born on June 30, 1854, in Boston. He prepared for the Institute at the English High School and entered our Class in its second year. He took Course I, civil engineering, and was graduated in 1875. He was well liked by his fellow members.

After graduation Dorr engaged in several jobs where his engineering knowledge was required, among which was work for the Massachusetts Harbor and Land Commission on the improvements at Fort Point Channel. In 1880 he was engaged with the sewer department of Boston, where he worked continuously for the rest of his active life, becoming chief engineer in 1905. In 1914 he became chief clerk of the department, which position he held until his retirement in 1924. Since then he enjoyed working as he felt it desirable and, up to his death, was employed by the Metropolitan Sewage Commission, estimating the tax charges to be assessed on the various cities and towns served by the system in Greater Boston. He was fond of raising flowers and vegetables in his garden at his home in Dorchester.

In 1892, Dorr married Nettie E. Wyer, who, with three daughters and eight grandchildren, survives him. He belonged to the following organizations: Boston Society of Civil Engineers, American Society of Civil Engineers, Dorchester Historical Society, the Veteran Association of the First Corps of Cadets, the Eliot School Association, the United Improve-

ment Council, and Sons of the American Revolution. For a long time he had been a member of the First Parish Church in Dorchester and of the Richard Mather Chapter of the Unitarian Laymen's League.

The last pleasant memory of Dorr is of a trip to Fall River on June 26, when, on invitation of George Eddy, we spent a day with him in that city. Leaving Dorchester by bus, we had a pleasant ride through towns and countryside new to Dorr, who said that he had never seen that part of the state. Eddy met us with his car. He drove us around the notable places, including the beautiful lake which furnishes the city with water, then by the homes of prominent citizens and to Tiverton, R.I., where we had a palatable lunch and enjoyed a fine view of Mount Hope Bay and the Mount Hope suspension bridge. Crossing the bridge to Bristol, we passed by the works of the Herreshoff Manufacturing Company, noting some of the America's Cup defenders, and thence back to Fall River, where we took the return bus, arriving home early in the evening. Truly a delightful day! — THOMAS HIBBARD, *Secretary*, 4 Ridge Road, Milton, Mass.

### 1881

The March issue of The Review mentioned the death of Jennie Maria Sheldon (Jennie Maria Arms, in our day) on January 15. We add here some excerpts from the *Greenfield Recorder-Gazette* of that date: "For some time Mrs. Sheldon taught geology and natural history in the Museum of Nature History, adjacent to the Massachusetts Institute of Technology which was then in Boston and also for a period was on the staff of the C. Alice Baker private school in Brookline. In November, 1897, Mrs. Sheldon was married to George Sheldon of this town [Deerfield], an historian, in Boston. She was his second wife. Together, Mr. and Mrs. Sheldon restored the Col. Joseph Stebbins house on Old Deerfield street now known as 'The Bunker Hill House' where she has since made her home. Mrs. Sheldon was a woman of unusual talents, extremely democratic, and charitable.

"On the death of her husband, Mrs. Sheldon became curator of the Pocumtuck Valley Memorial association, a position she held for the remainder of her life. . . . Mrs. Sheldon was elected a trustee of Deerfield academy 25 years ago and for many years made an annual contribution for its support. She purchased the old post office and Grange hall and removed it to the academy grounds where she had it restored as the present Girls club building. In 1932 Mrs. Sheldon presented to the academy, in the name of her father, George Albert Arms, the present beautiful brick science building, fully equipped. . . . Among Mrs. Sheldon's numerous writings is 'Story of a New England Boy,' a biography of her father, who built the Arms block on Main street, Greenfield. . . . One of Mrs. Sheldon's most remarkable papers is 'Pitted Stones,' an interesting study of the polished flat oval stones believed made by Neolithic



1881 Continued

man in the stone age. . . . Mrs. Sheldon's other contributions to the study of science include 'Guide to the Invertebrates of the Synoptic Collection in the Museum of the Boston Society of Natural History,' 'Deerfield Memorial Stones,' a study of Connecticut valley clays, and observation lessons on animals. . . . She also was co-author of 'Guides For Science Teaching No. VIII Insecta.' Mrs. Sheldon was made a fellow of the American Association for the Advancement of Science. . . .

"Mrs. Sheldon was a member of the Boston Society of Natural History, Naples Table Association for Promoting Laboratory Research by Woman, Massachusetts Woman Suffrage association, Equal Suffrage association for Good Government at Boston and the George Washington Memorial association at Washington. . . . Mrs. Sheldon had no children and none of her family is living. She is survived by a grand-niece, Mrs. W. Herbert Nichols of Greenfield, and by a great-grand-niece and nephew, Mary Jean Nichols and George Sheldon Nichols." — FRANK E. CAME, *Secretary*, Chambley, Canton, Quebec, Canada.

## 1883

Notes from the Class, as usual, may be represented by zero to the *n*th power! The Secretary, recreating in Florida — now his legal residence, along with Harvey Mansfield — is writing a book, "American Government from the Inside," which retails his experiences during 40 years of investigations and reorganizations of municipal, state, and Federal governments in relation to their methods of accounting, auditing, budgeting, and so on. Previous engineering training at Tech and some 14 years of engineering practice, prior to undertaking labors on the financial side, proved to be of very great value in the latter.

Letters have been received from Horace Gale, George Underwood, George Bryant — who is also in Florida as a winter visitor — Eppendorff in Buffalo, Mansfield at Tampa, and Julien Vose in Boston.

Urgent appeals for subscriptions to the Alumni Fund fill the mails and presumably we all are scratching around to save a nickel or two from Uncle Sam's tax-gatherers, so we may keep the Class with the "also rans," if not at the wire!

Dear old Georgie Capen has passed on, after heroic struggles with difficulties physical and financial since the War. He was happy, however, and always in good spirits at his most fortunate home in the Masonic Hospital at Shrewsbury, Mass., these last years. — HARVEY S. CHASE, *Secretary*, 390 Vitoria Avenue, Winter Park, Fla.

## 1885

For about 25 years, Hugh MacRae of Wilmington, N. C., has been interested in the development of certain branches of animal husbandry in the southeastern part of North Carolina. Finally interest focused on a program for the economical feeding of dairy cattle. By bringing together bits of usable and valuable infor-

mation from a number of states and from different countries, a system of continuous grazing on annual crops has been evolved. MacRae has just published a pamphlet setting forth the results of his experience. While he means this to be self-supporting, it is not primarily a money-making project but an effort to benefit his native state, for on the outside of the pamphlet appears: "The South will come into its own when its fields are green in winter."

Dr. Charles R. Allen writes from San Antonio, Texas, that there are about 16 M.I.T. Alumni in that city who occasionally get together. — ARTHUR K. HUNT, *Secretary*, 145 Longwood Avenue, Brookline, Mass.

## 1887

Very little class news at this writing. Income tax worries and other causes are apparently diverting the attention of many of our members who might otherwise be of yeoman service in furnishing fireside reading for those stay-at-homes who lack the thrills of Palm Beach or the Riviera. However, a few have gallantly responded to the call, and the Secretary is pleased to furnish the latest in the line of news, and also to express his gratitude to the writers.

Oscar Nutter, whom we have missed from our reunions of later years, with the exception of our 50th, remembered the Secretary with a card of greetings at Christmastime. We hope he will favor us with his presence more frequently as time rolls on. — Franklin Brett sent New Year's greetings on the final hour of the old year from his Duxbury home. He says he is enjoying perfect health and would be glad to greet any of the Class who might be cruising down the Massachusetts South Shore. — Solomon Sturges appears to be enjoying life in Chicago, where they were blessed with delightful weather at the time of writing. He is interested in the program for Alumni Day, June 6, and hopes to take in the annual class dinner and the farewell to Rogers at that time.

William H. Brainerd started on a motor trip to California on February 10. He will cruise south to Mobile, Ala., following the Old Spanish Trail to San Diego, where he proposes to spend four or five weeks. After that he will work up the Coast, probably as far as Seattle, returning via Yosemite, Colorado Springs, Kansas, Kentucky, and points east. He writes: "Two items about myself may be of interest. At the annual meeting of the corporation and of the board of trustees of the Boston Floating Hospital I was elected to my 38th consecutive term as clerk of the corporation and the board of trustees. I am the only survivor of the original incorporators. I have recently turned over to the town advisory committee a draft of the revision of the building bylaws of the town of Wellesley, being chairman of the committee; 25 years ago I was chairman of the committee which drew the first bylaw for the town. I also served as chairman of a committee which worked out a set-back law for 'fire protection,' which enabled us to prevent the building of

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slums by crowding buildings, and lessened damages in future street widenings. This was before the Great and General Court had given the town the right to establish permanent building lines."

Ben Lane says that he has too many other troubles, largely the tax statement which bothers so many people just at this time, to give any decent attention to the doings of the Class: "Sorry to be unable to supply anything worth while," he adds, "but I must express my admiration for the devotion with which you hang onto the job. Perhaps the most interesting piece of news to me is that after this corporation (Allen-Lane Company) has occupied for more than 50 years the location at 266 Devonshire Street, the whole building having been hired right over our head, we have been obliged to move and are now located at Number 201 on the same street; so kindly note on your records accordingly."

Herbert Wilcox writes from sunny California: "Have been keeping quiet since we came home from our trip. Have had an unusually fine winter, so far as weather is concerned. It has rained quite a little in the last two days, but even with that we have had less than eight inches for the season to date, and no frosts yet. Last week the temperature got above 80 on several days. I won't be able to get east for the June festivities this year. My daughter and family, which include two boys, seven and nine years old, are coming out to spend the summer with us here. We have been talking some of a two or three weeks' trip to Mexico City in March, but it may end in talk only. I will enclose some snaps from our trip on the *Reliance* last summer. I may send some later of our trip across Europe and through the Mediterranean." — True to his promise, Wilcox sent over 100 views of rare beauty and interest, a number taken at North Cape under the midnight sun being of especial appeal. Once again the Secretary desires to express his appreciation of the kindly consideration.

The response of the men of '87 to the Alumni Fund has been both prompt and generous, as the total subscriptions of rising two thousand dollars bear testimony. However, the drive is still on, and to those still wavering, the time-old adage, "Now is the time to subscribe," may serve as a stimulant. — NATHANIEL T. VERY, *Secretary*, 15 Dearborn Street, Salem, Mass.

## 1888

During the latter part of January and all of February Mr. and Mrs. William G. Besler were cruising among the islands northerly and easterly of the Caribbean Sea to Panama and thence along the north coast of South America down across the equator to Rio de Janeiro, where they stayed about a week, returning to New York the latter part of February. Besler has been selected by the Alumni Day Committee for the speech to be made by a member of the 50-year Class at the '38 Class Day ceremonies on June 6. With his long experience in speechmaking as presiding officer of numerous associations

## 1888 Continued

and clubs in St. Louis and New York, as well as at all of our reunions and class dinners for the last 25 years, we know that he will sustain the reputation of the Class of '88.

Sanford Thompson made a call on the Secretary when passing through Norfolk on his way to Florida with Mrs. Thompson during the latter part of January. They returned to Boston about February 22. — Harold Gross of Eureka, Calif., member of our famous tug-of-war team that defeated Harvard in 1887, has been in the midst of terrific snowstorms recently, some of the details of which we hope to give you in the next issue. We have suggested to Gross that he bring Russell Clement, another member of the tug-of-war team, to our golden anniversary in June, where they would be "guests of honor." Clement's home is in Oakland, Calif. — John Griffin Faxon, our class poet laureate, has ready for promulgation at our Golden Jubilee Class Dinner a poem which will do justice to the acts and accomplishments of the Class which our lamented James C. T. Baldwin always called "the glorious Class of '88." — Walter I. Towne, VI, although not in the best of health, is planning to drop in on us at the seashore sometime between June 3 and 5 to see his old associates whom he has not seen for half a century. We shall be glad to give him the glad hand of reunion.

Fred Richardson Nichols, L.W.E. (letter writer extraordinary), deserves a medal of honor for responding to the Secretary's request with a six-page letter telling all about the glorious climate of Florida but admitting that on December 7 the temperature extremes were from 44 degrees to 29 degrees! However, his sweet peas were covered up, so everything was O.K. He discourses on Florida for summer residence, golf, shuffleboard, contract — in which he admits he is making pretty fair progress; he goes to lectures at Rollins College, Winter Park, only five miles from Orlando where he lives; but the best thing he says is: "I plan to be in Boston next June for our 50th and around New England for a month or two." We will be glad to see you, Fred.

Before you read this you will have received a long letter from the Secretary telling all about the elaborate plans that are being made by your reunion committee of seven for our big celebration at —, Mass., near Boston, with a post card inclosed for you to return to the Secretary P.D.Q. You cannot afford to miss this event, even if you have to sell some of your Baby bonds. Get your car overhauled and bring all your classmates who do not happen to have a car.

Your Secretary has been getting in some golf recently with the Peanut King of Virginia, on his private course with a better water hole than Chebeague Island. So look out! — BERTRAND R. T. COLLINS, Secretary, 407 Warren Crescent, Norfolk, Va.

## 1889

The Class has suffered another severe loss in the passing of Frank Hart on January 18, and again the Secretary finds it

difficult to write about it. The Boston *Evening Transcript* of that date had the following account of his life: "Francis Russell Hart, president of the United Fruit Company and a prominent Boston banker, died of a heart ailment at noon today at his home, 474 Beacon street. He was sixty-nine. . . . Two months ago Mr. Hart went to Europe for a rest, remaining abroad for a month. When he returned his friends knew the trip had done him no good. A week ago he attended a directors meeting at the United Fruit offices, but he went home when it was over and the doctor put him to bed. He had not been fully conscious for the past three days. For thirty years Mr. Hart had been active here in banking and business, principally the importing business. He was thoroughly familiar with the history of Latin America, having lived for a time in the West Indies, and visited South and Central America many times. He was an authority also on the history of our own region and last April was elected president of the Massachusetts Historical Society. He was the author of 'Admirals of the Caribbean,' 'The Siege of Havana' and 'The Disaster of Darien.'

"Born in New Bedford in 1868, he was graduated from M.I.T. at twenty-one and went to the West Indies as an engineer, eventually becoming president of the Cartagena-Magdalena Railway in Colombia. Back in Boston by 1896, he became associated with the Old Colony Trust Company and ultimately was a director also of the First National Bank. His other directorships included a score of companies, most of them importing concerns. He became president of United Fruit on Jan. 11, 1933, succeeding Victor M. Cutter, who had become chairman of the board. Tufts College made him an honorary master of arts. He served for nineteen years as chairman of the finance committee of M.I.T., resigning in 1936 because his business interests demanded more of his time. He was an active member of the American Academy of Arts and Sciences, the American Antiquarian Society, the Colonial Society of Massachusetts, the English Speaking Union, the Pan-American Society, the New England Historic Genealogical Society, and the Society of Natural History. He also was a Fellow of the Royal Geographical Society, and during his time in Colombia he served as American consul. Surviving are Mrs. Hart, who was Helen Bronson Hobby of Northampton; a son, Francis Russell Hart, Jr., and two daughters, Mrs. Helen W. Nichols of Boston and Mrs. Gwendolyn H. Palmer, who is now on the way home from a wedding trip to the Caribbean." The funeral was held in King's Chapel, Boston, on January 20 at three o'clock. At that hour 40 steamships in widely separated parts of the world stopped their engines for two minutes, to do honor to our distinguished classmate.

The following is part of a letter the Secretary has received from Hollis French: "My real trouble is, of course, the loss of my leg, but I am getting on

surprisingly well. I always thought that when a man lost a leg he just bought a new one and in a short time he could get about as usual. Well, I find it is not so simple as that, for you have to learn to walk all over again. It takes a boy about a year to learn to walk, and at our age it takes a lot longer, as we know too much. However, I've got as far as walking on level ground with two canes, but unfortunately I can't negotiate stairs without crutches, so I have to take the latter when I go out, which is a nuisance. However, I'm coming on and I hope this year will see the end of my crutches. Time does not hang heavy on my hands for, as Jimmy Cartwright used to say, I'm as busy as a cow's tail in flytime. I go out in good weather to the office, and so on, and attend to my office correspondence in the morning, and in the afternoon I am busy on some work of my own which is absorbing. Don't let anyone think I'm not fully occupied or that I am grouching over my hard luck, because that is far from being so, and I am looking forward to being much more active in a year or so."

The nominating committee, appointed by the Secretary, which consisted of Parker Fiske, Frank Hobbs, and Jasper Whiting, has reported as follows: For president, Hollis French, and for treasurer, Edward V. French; they to serve in perpetuity, if that is the word. Election will be held at the annual dinner in April.

The Secretary has received word of the decease of Frederic D. Hall on February 3 but has no particulars. — Paul Hawkins got out a Christmas card with a pathetic verse, which he says he adapted from John G. Saxe. The Secretary regrets that The Review Editors cannot print poetry in the class notes section. — WALTER H. KILHAM, Secretary, 126 Newbury Street, Boston, Mass.

## 1891

For no good reason, we have very little to report for this issue of The Review. Some of our men are off on their winter holidays; others of us are busy trying to find out what the powers in Washington are going to do to us next. Big business may not be simon pure and undefiled, but taken as a whole its personnel would stack up fairly well with the other citizens of this great country and perhaps average up to those who are trying to run the nation's affairs.

We started to arrange for a class dinner in February, but some of the stand-bys were off on trips or couldn't come, so we will try again later when the weather is more moderate.

The Alumni Fund Committee have been after us, and several of the Class are working on this problem. Will Wilder heads our Boston contingent. We want to do our part. Fred Moore was asked to look after the Midwest contingent, but he has been in Arizona most of the winter. He writes from the Arizona Inn at Tucson that he has so far had good success in avoiding a repetition of his sickness last year. He is planning to get back to Chicago in April.



The sympathy of the Class is extended to Hartley White in the loss of his son, Emery, and the more recent loss of his wife on December 10. His fourth grandchild, a boy, arrived in February. — George Holmes has been ill but is improving.

Several postal cards have been received from Charlie Garrison in Santa Barbara. He reports a lot of rain during January and February in sunny California, but no snow so far. — Charlie Hanington sent Barney the annual report of the Colorado Museum of Natural History. Charlie is president and has been greatly interested in this work for many years. — Harry Young went to Nassau again this winter. He seems to like the climate and bathing — and why not? — Steve Bowen is off somewhere on one of his winter trips. — Fred Rose spent the winter in Florida.

Walter Hopton wrote Anne Carpenter in Buffalo about the Alumni Fund and received a nice letter in reply: "Your very courteous letter should have been answered before this, but I had a slight accident which was quite painful. I have always been very glad to meet the Tech men and did meet many of them during the War years. Conditions were such at Tech that I knew well only the boys in my section, and now they have wandered far and wide. Because I have been privileged to have the friendship of the few, I am very interested in all Tech affairs. I know many boys have gone to Tech through my interest." — What our coeds lack in numbers they make up in loyalty to Tech, and there are several that we hear from once in a while.

Subscription letters brought replies from some whom we have not heard from for many years. Leonard Wheeler of Troy, Ohio, writes: "I hope some of these days to meet you and the other members of '91 — perhaps at the 50th class reunion." — J. M. Joy writes from New York, where he is connected with International Affairs, Inc., located at 10 East 43d Street: "I spent such little time with the Class of '91 that I became acquainted with very few members. My first natural inclination was to go to Tech because I was born and brought up in the town of Amesbury, Mass., about 40 miles from Boston. I had early planned to go to Exeter and prepare for Tech, but I was persuaded before this happened to go to Cornell, which I did. However, about the middle of my junior year at Cornell I became ill and went back home to recuperate. Feeling better and wishing to take up some course, I decided to take advantage of being near Boston and do some special work at Tech in chemistry and some other subjects, and then go back to Cornell for my senior year. At the present time I am a professional engineer, specializing in motion picture engineering and have been so engaged for about 12 years, also as technical advisor to one of the leaders of the motion picture industries. For almost ten years I spent nearly three-fourths of the time in Europe, in connection with engineering and technical matters relating to the industry. In spite of the fact that I was connected with M.I.T. for such a short time, I have a great deal of regard

for it and place a high value on what knowledge I absorbed in the short time I was there and realize its high standing in all scientific work. I am interested in the above company, which was organized to be of service to American and foreign business, because during my period in Europe I made many desirable contacts."

George Hooper has been checking up on the men on the Pacific Coast, and four subscriptions have come in from that district: "I have heard nothing yet from England and Viele. The former has only a post office address and my pull with the Administration is not sufficiently strong to enable me to secure a street and number. He apparently wants Privacy with a capital 'P,' since he has never responded to my original letter to him, asking if I might call and renew acquaintance. We were side by side in the front rank of the first form of Company A of the Tech Regiment. I had intended calling upon Francis Viele in his new home at Palos Verdes during this past week, but one thing and another has prevented, so that it will probably be late this week, if not later, before I can get there. As Bert Kimball is near by, I will drop in there, also."

We have received notice of the following changes in address: George W. Bryden, who formerly lived in Chelsea, Mass., is now located at the Hotel Majestic, 29 Quincy Street, Chicago, Ill. — J. Gifford Thompson's new address is Box 67, Coolidge Corner, Brookline, Mass. — Francis S. Viele, who formerly lived in Phoenix, Ariz., is now at 3648 Palos Verdes Drive North, Palos Verdes Estates, Calif. — HENRY A. FISKE, *Secretary*, Grinnell Company, Inc., 260 West Exchange Street, Providence, R.I. BARNARD CAPEN, *Assistant Secretary*, Early Convalescent Home, Cohasset, Mass.

#### 1896

To John A. Rockwell has come a well-merited token of esteem and honor in the form of a presentation of a sterling silver, four-inch disk. On one side the letter, T, is shown in the center, and around it the inscription: "To John A. Rockwell '96 in appreciation of 40 years devoted service to M.I.T. athletics." On the reverse is: "Presented at the 296th meeting of the Advisory Council on Athletics, February 8, 1938." John has made a remarkable record in keeping a fatherly eye on student athletics throughout the various changes in the membership of the Advisory Council. The other members felt the urge very strongly to make this timely recognition, and it was a most happy occasion. The presentation was made by H. E. Worcester '97, fellow member of the Advisory Council, and it came as a complete surprise to John.

The Secretary had the pleasure of a call from Billy Haseltine on January 28, and Billy still retains his youthful looks and vigor. — The Secretaries had the pleasure of dining with Billy Anderson at the Copley Plaza on January 30, practically on the eve of Billy's departure, with Mrs. Anderson, for a trip to Bermuda, on which they were accompanied by Billy's son and his son's wife.

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Arthur Baldwin has sent a clipping from the January 19 issue of the European edition of the New York *Herald Tribune*, in which was an editorial on the good work done by the American Chamber of Commerce in France during the past four or five years. It attributes these successful years largely to the stewardship of Arthur Baldwin in the office of president. It points out that these have been most difficult years in making substantial progress in the trade relations between France and America. In making his farewell address as president, Arthur referred to the labor conditions, industrial conditions, and social conditions in the world today and appealed for greater mutual confidence between employers and employees. Time only will show whether Arthur's farewell address and his counsel will go down in history like that of the illustrious Father of our Country.

Additional reports from the Fullers have appeared in the Brockton daily *Enterprise*. They spent a month and a half on an automobile trip in the West, covering some 7,000 miles in the states of California, Utah, Nevada, Arizona, and New Mexico, and then, to cap the climax, journeyed to Mexico City. The description of their Mexican trip is most interesting and also highly informative for anyone contemplating an automobile trip into Mexico, where the roads are now so much improved that travel is no longer difficult along the main highways. — Henry Jackson announces that he finally has the moving pictures of our 1936 reunion practically completed, so that they should become available for showings in the near future. Henry's poor health, and other matters, have been the cause of the delay.

The Secretary attended the annual meeting of the American Institute of Mining and Metallurgical Engineers in New York in February, and took advantage of the opportunity to have a '96 gathering, arrangements for which had been made through the kind offices of Admiral Bakenhus. The following fellows sat down to dinner in the New York Athletic Club on Tuesday evening, February 15, at 7:00 P.M.: F. W. Andrew, A. F. Ruckgaber, Charlie Trout, L. K. Sager, Jim Melliush, John Tilley, Bakenhus, and Locke. A number of other fellows were prevented from attending by various engagements. Bill Dorrance had hoped to come down from New Haven but was not able to make it at the last minute. Lou Morse had an engagement in Washington, and Charlie Lawrence had to make a trip to Detroit. Russell Starr was scheduled for a concert that evening in the Brooklyn Academy of Music by a male singing organization of which Starr has been a member for many years. All present were delighted to renew association with Fred W. Andrew. The Secretary had not seen him since school days. He seems to be another one of our Class who has kept young and busy. Andrew was at one time lost for a considerable period. However, he said that he could have been located through his old home in Boston, and actually he was in business in Ohio. He is



1896 *Continued*

now located in New York as consulting engineer for the Ozalid Corporation, which is a very progressive organization handling new developments in positive printing and dry developing processes, such as ammonia process for white prints instead of the more common blueprints. John Tilley said that he had had occasion to run over to Boston not long previous and had spent some time trying to locate Boston baked beans, but since the day was not Saturday, his quest was fruitless, and he finally had to satisfy himself with a feed of oysters at the famous old Union Oyster House in the market district. In order that John might be happy, the Secretary procured a can of the famous Friends slow-oven baked beans, which are equal to the best Boston variety, in the Secretary's opinion, and sent them to John for his delectation. Charlie Trout said that he had added another to his string of jobs, having become an official of the Great Lakes Dredging Company. — CHARLES E. LOCKE, *Secretary*, Room 8-109, M.I.T., Cambridge, Mass. JOHN A. ROCKWELL, *Assistant Secretary*, 24 Garden Street, Cambridge, Mass.

## 1900

Professor Locke '96, Secretary of the Alumni Association, sends in the following: "Salvador Madero '00 makes his headquarters in Parras, Coahuila, Mexico, in the state of Sinaloa, overseeing a tungsten mine which is owned by the Madero interests. All last year he and his son, Salvador Madero, Jr., '29, were operating the factory in Parras, making rubber from the guayule plant, but when the price of rubber dropped to 13 cents a pound, operations became unprofitable and the plant was shut down on November 1. At that time Salvador Madero, Sr., left for Mexico City, and from there went to the tungsten mine, where his main activity has been the installation of a small concentration plant for treating the ore. It is their expectation that the rubber plant may start up again late in March. Salvador, Jr., had been connected with the rubber plant in Parras for six years, and as much of his work had had to do with pumps, he readily found a position with the Pomona Pump Company, as general sales manager for Mexico. This company has factories at St. Louis, Mo., and Pomona, Calif., and is at the present time the largest manufacturer of turbine pumps in the industry. He has to cover the entire Mexican territory, visiting the various distributors of Pomona pumps. He reports that at the present time business is at a low ebb and there is a general lack of confidence. Industries and agriculture have been affected tremendously by the unsettled labor situation, strikes, and the agrarian problem, supplemented by the hesitancy of local banking institutions to supply credit."

Funeral services for Ingersoll Bowditch, trustee and treasurer of the Faulkner Hospital and a member of the Boston Hospital Council, were held at the First Congregational Church, Jamaica Plain, Mass., on Sunday, February 13, at 3 p.m. He died February 11 after an illness

of two weeks. A native of Jamaica Plain, he made his home at 32 Woodlawn Road there. He was born on May 31, 1875, son of Charles Pickering Bowditch. He received his education at Harvard and M.I.T. He leaves a widow, a daughter, and two sons. He was a civil engineer and director of the State Street Trust Company, Massachusetts Cotton Mills, and Massachusetts Hospital Life Insurance Company. Several years ago he became interested in hospital management. He was treasurer of the Instructive District Nursing Association of Boston, the Jamaica Plain Dispensary, trustee of the Charity of Edward Hopkins, and assistant treasurer of the American Academy of Arts and Sciences. Messrs. Neall, Ziegler, Allen, and the Secretary represented the Class at the funeral. H. W. S. in the Boston *Herald* writes: "To be without Ingersoll Bowditch is something we had not contemplated. Taken from us when his splendid spirit and willingness to work were evidenced in several humanitarian enterprises and in the management of a great many estates and trusts for family and friends who knew his ability and trustworthiness; of finest heritage; this Christian gentleman, whose ancestors had also done much for New England, has left us so concerned to be without him that it will take more than the usual time to accustom ourselves to the remedial forces which are nature's way of showing us gains that compensate for losses. Many generations will be reminded of this fine man as they pass through his hospital; as they meet with the extensions of his work in State street; and as they sense the also everlasting spirit of his beloved Chocorua."

Mr. and Mrs. George Ellis Cole announce the marriage of their daughter, Bertha Cole Leonard, to Richard Westcoat on Saturday, the 19th of February, at Taunton, Mass. — C. BURTON COTTING, *Secretary*, 111 Devonshire Street, Boston, Mass.

## 1901

Except for those members of the Class who are so fortunate as to have country estates, either large or small, the new crop control law recently passed by Congress and signed by the President may not be considered as having any special personal interest. The new law contains some 25,000 words, and committee explanations required about 75,000 more. It would appear, therefore, that there would be a lot of new jobs for lawyers to interpret the law, as well as for numerous other new government employees to make certain that the various provisions of the law are properly observed. Soon it would appear that so many government employees will be required to make sure that the farmers grow less and less that ultimately the good old law of supply and demand will be entirely junked. However, even those who framed the law seem to doubt whether it will work and perhaps eventually, like the A.A.A., it may be declared unconstitutional. In the meantime it is interesting to read annual reports of big concerns like that recently

published by E. I. du Pont de Nemours and Company, which indicates that millions of dollars are still being spent without hope of immediate profit, in order to allow the production of products which will prove of great benefit to the country and which should ultimately allow the making of reasonable new profits. We may, therefore, continue to look forward hopefully to the future and trust that merit systems, like those in which Ed Davis of our Class is interested at Waterbury, Conn., may help to make certain that as many as possible of the employees required by the government may be really earning their salaries. Ed writes that he is still vice-president of the Connecticut Merit System Association and that he is very hopeful of future results.

Other brief items of class news have been received as follows: Ralph Stearns, who is associated with Mead and Scheidenhelm, consulting engineers of 50 Church Street, New York City, advised that he has been doing a lot of research work in connection with hydroelectric stations costing from \$6,000,000 to \$9,000,000, located in Virginia and West Virginia, and from what he states we judge that these are private enterprises and not to be considered as government yardsticks. — Lon Isham, from whom I had not previously heard since shortly after we were graduated and from whom it was mighty good to hear again, has recently written from his present address at 2064 23d Avenue, North, Seattle, Wash., to state that he has recently completed a machine to separate gold from reasonably dry ground. That sounds highly interesting and we hope that he will prove so successful in the operation of his machine that he will be making a visit East in the not too distant future. — Robert White, Jr., gives his present address as 123 Washington Street, Grove Hall, Mass., but we are sorry to advise he did not give any information regarding his present activities. — Harry Folsom briefly advised on his data sheet that he continues to be a sales engineer for John A. Roebling's Sons Company, 216 South Alameda Street, Los Angeles, Calif. — Austin Hyde gives no information about himself except to state that he is still plant manager of the Beaver Chemical Works at Damascus, Va.

LeRoy Backus advised that he retired in 1928 but has since then been able to devote a lot of time to private financial interests and is president of three companies, as well as director of three others. He states that in the summer of 1936 he went to the Olympic Games at Berlin, Germany, and then enrolled in an art course at the University of Berlin. He also indicated that he expected to return to Germany again the latter part of last year for another year of art work. Backus is, therefore, apparently making good use of his retirement from business and we hope to hear more of the results of the art work at the University of Berlin, and maybe also he can give us an idea of what is really going on over there at the present time. He gives his present United States address as 211 Madison Street, Seattle,

## 1901 Continued

Wash. — According to his class data sheet, Bill Sweetser is still in charge of the department of mechanical engineering at the University of Maine, and I surely hope to see him sometime this spring or summer when I am in Maine. — Ralph Whitman did not provide any special news except to state that he still continues as a captain in the Civil Engineer Corps at the Bureau of Yards and Docks, Navy Department, Washington, D.C. — Phil Moore continues as vice-president of Poor and Company, 1310 Railway Exchange, Chicago, Ill., and loquaciously notes that "he is now a grandfather." He should, therefore, soon be able to provide a lot of interesting personal news even if there's nothing to report about business.

Stuart Miller, who is another one of our retired classmates, apparently is finding plenty to do in connection with rifle and gun clubs as well as in his capacity as vestryman of St. Paul's Cathedral at Marquette, Mich., and as treasurer of the diocese of northern Michigan. — Louis Williams gives his present address as plant manager of Ray Industries, Inc., Book Building, Detroit, Mich. — Anna Billings Gallup, who for so many years was curator in chief of the Brooklyn Children's Museum, has, according to a news item received from the Alumni Office, recently resigned, and we understand she is now making her home at "Chrisways," North Stonington, Conn. About a year ago Miss Gallup made a visit to the Hartford Children's Museum and your Secretary had the pleasure of having lunch with her at that time and hopes that she may have an early occasion to make another visit to Hartford so that the past pleasant luncheon may be repeated. — The Alumni Office advises that Carl F. Johnson has removed from Lake Tahoe, Nev., and is now located at 126 West 6th Street, Los Angeles, Calif. — We are sorry to advise of a news item from the Alumni Office to the effect that Leonardo Hering died on October 11, 1935. No other information was furnished; so will be glad to receive any additional information regarding this classmate, whose address has been on the missing list.

The Alumni Association advises that very special plans are being made for Alumni Day, which will be held this year on Monday, June 6. Special ceremonies are to take place in connection with the giving up by M.I.T. of Rogers Building on Boylston Street. Registration will be arranged for in that building just as it was back in our day, and there will be a number of interesting ceremonies. We hope as many as possible will be able to arrange to reunite at that time. Further details of other interesting events for Alumni Day will, in due course, be available. — ROGER W. WIGHT, *Secretary*, Care of The Travelers Fire Insurance Company, 700 Main Street, Hartford, Conn. WILLARD W. DOW, C.P.A., *Assistant Secretary*, 20 Beacon Street, Boston, Mass.

## 1902

Your Secretary met Seabury at the annual meeting of the local section of the American Society of Civil Engineers in

January. Seabury was present in his capacity of Secretary of the national society. He expressed his regrets that he could not have been at the reunion in June but said that his vacation had given him the needed rest and that he was again in good health. — Lewis Moore moved the first of February to 38 Memorial Drive, Cambridge, where his new firm, Moore and Haller, Inc., carry on as consulting engineers. — A letter has been received from Bosworth, who recently stopped off in Salt Lake City, Utah, and had a chat with Mendenhall. Bosworth sent the Secretary a copy of the *Deseret* (Utah) *News* which contains a fine picture of Mendenhall with the subtitle: "Looms as new commissioner." He will be commissioner of public safety if chosen. — Hammond, as our classmates should have seen in the February Review, is chief engineer in charge of sewers and highways in the borough of Manhattan. — We also note that Kellogg, as president of the Edison Electric Institute, is taking a very prominent part in the discussions of the current public utility problem.

About the middle of January, Dan Patch started for Hawaii on a business trip. We haven't heard from him but presume he is still there. He came looking for sympathy because of his assignment but received none. — Hathaway, member of the firm of Starrett and Van Vleck, has received the award for a large school in Bloomfield, N.J. — On February 20 the engagement of Miss Carol White of Milton to Robert S. Sherman, Bert Sherman's son, was announced. — Montgomery reports that 38 members have paid their class dues to date, with 20 paying five dollars, 15 one dollar, and one each at two, three, and four. Come forward and send in yours. — A letter from Robbie suggests that as one of the classes which was educated in part, at least, on Rogers' steps, we should have a well-filled reserved table at the banquet on Alumni Day and possibly a week-end party near Boston. Suggestions or criticisms are welcome. — Joe Philbrick's company, the Parsons Chemical Company, moved their quarters from the Bush Terminal in Brooklyn to Passaic the first of the year. — BURTON G. PHILBRICK, *Secretary*, 246 Stuart Street, Boston, Mass.

## 1903

The Secretary has returned from an extensive trip through South America, visiting all the larger countries. He finds generally a real boom everywhere — lots of money being made and lots of it being spent — much like our own country before 1929, but even more so. The only other news we have has to do also with travels. Gleason left this week (February 22) for a month in the West Indies and Colombia; and Hepburn is traveling in Europe. The rest of us are enjoying a usual New England winter in Massachusetts, whether we like it or not. We are still in the Alumni Fund Campaign, and have sent out our class letter. It is late, but we hope it will prove valuable and effective. As these notes are written, about 30 men have responded with an

average of about \$85, each. We hope this will have been bettered by the time you read this. — FREDERIC A. EUSTIS, *Secretary*, 131 State Street, Boston, Mass. JAMES A. CUSHMAN, *Assistant Secretary*, 441 Stuart Street, Boston, Mass.

## 1907

On Friday evening, February 4, 14 men of our Class assembled in the Silver Room at Walker Memorial at the Institute to eat, join in good-fellowship, and listen to interesting talks by two of our own classmates who are doing important work in the world. This was the smallest number who have ever attended one of these Boston midwinter class gatherings, but some 18 or 20 of the usual stand-bys were unable to come on account of illness, business engagements out of town, or various social obligations. Two men were on hand, however, who never before in the past 30 years have attended a class affair, Ralph Knight and Theodore L. Smith; and two others, Leon Chaffee and Percy Colvin, have rarely met with us in the past. Besides these four, the men present were Dick Ashenden, Clinton Barker, George Crane, Tom Gould, Peabo Peabody, Bob Rand, Don Robbins, Gilbert Small, Oscar Starkweather, and the Secretary.

After a good dinner and a few comments by the Secretary regarding the Alumni Fund Campaign and referring to some of the men who had sent special greetings, Theodore Smith, who is mechanical engineer and research expert for the Gillette Safety Razor Company, told most entertainingly and instructively of the development, method of manufacture, and refinement of material and design of the Gillette razor blade. The interest aroused was made evident by the many questions which the fellows asked. Possibly the most practical bit of information that Ted gave us was that the principal reason for unsatisfactory shaves is inadequate preparation of the face. He said that in most instances the reason for lathering the face seems to be chiefly to "identify that portion of the face which is to be shaved," whereas water and lather should be applied and rubbed in for at least two minutes before the razor is used, and in cases of tough beards, for five minutes. (The Secretary passes this on to you, hoping that in so doing he may make life happier for you!)

E. Leon Chaffee, professor of physics and communication at Harvard, regarding whose recent discovery we wrote in the last issue of *The Review*, told us in his usual modest and casual manner of his experiments, extending over the past 30 years, in causing rain to fall by dropping electrically charged sand particles through clouds from an airplane; in studying the action of the inner portion of the brains of monkeys and dogs by inserting small coils of wire into the skulls of such animals and exerting electrical influences on them; in research on the electrical response of the retina of the eye under stimulation by light; in controlling the travel of torpedoes by wireless; and in research on the laws govern-



1907 Continued

ing the behavior of vacuum tubes, especially, during the last ten years, on large tubes. Although Leon said that the recent newspaper story about his work (see the March Review, page ix) greatly exaggerated his accomplishments, nevertheless the fact is that our classmate is known internationally, and he brings honor to 1907.

Ralph Knight, VI, is an executive in the experimental end of the manufacturing department of the United Shoe Machinery Company, with office at 140 Federal Street, Boston, having been in this position since 1914. He lives at 81 Lovett Street, Beverly, Mass., with his wife and two adopted children, now 16 and 13 years old. — Percy Colvin, who for nearly 30 years was connected with the Colvin Iron Foundry at Worcester, Mass., is now a salesman of securities for F. L. Putnam and Company of Boston and Worcester. His office is in the State Mutual Building, Worcester, and home at 58 West Street in the same city. Percy is married and has a 23-year-old daughter. — Charles Everett, who was associated with our Class for only our senior year, having received his A.B. degree from Harvard in 1906, attended L'École des Beaux Arts in Paris from 1907 until 1911. He was a draftsman with the architectural firm of Parker, Thomas and Rice in Boston for two years, and then became an instructor in architecture at Tech. In 1916 he became assistant professor at the Institute but resigned in 1918 to enter private practice, and since that time he has been thus engaged. He has specialized in residential work, particularly in the Cape Cod style of house. He does most of his work at his home, 144 Main Street, Hingham, Mass., where he lives alone, as he has never married.

Through the courtesy of Dennie '11, we received a clipping from the Worcester (Mass.) *Telegram* containing a very good picture of Charlie Allen '07 and telling of his being presented with a Silver Beaver, the annual Boy Scout award, emblematic of outstanding service to boyhood, at the "Scout-O-Rama" held by the Worcester area council of the Boy Scouts on February 12. The award was presented by George J. Fisher of New York, national deputy chief scout executive, and the citation, drawn up by the Worcester council court of honor committee, reads as follows: "A most active agent in promoting wholesome boyhood activities in his home town, including athletics as well as scouting and other clubs. He has been a persistent mover for consolidation of independent troops with the Area Council for better service to scouts and he increased this effort during the hard years. A staunch supporter of progressive camp improvements, both materially and as a matter of policy, he has also been a strong influence in securing the support of many other worthy citizens for scouting."

Charlie is associated with Ed Squire of our Class in the Allen-Squire Company, shoe manufacturers, in Spencer, Mass., and has been active in scout work since 1922. This kind of service brings honor to

our Class, just as much as business or professional success. — BRYANT NICHOLS, Secretary, 126 Charles Street, Auburndale, Mass. HAROLD S. WILSON, Assistant Secretary, Commonwealth Shoe and Leather Company, Whitman, Mass.

## 1909

Richard L. Shaw, Art's son, was married to Miss Barbara F. Livermore of West Newton, Mass., at the Second Church of Boston on February 12. The bride was given in marriage by her uncle, Dr. Henry E. Wriston, President of Brown University. Dick and his bride went to Lake Placid, N.Y., for their wedding trip, and while there he was stricken with appendicitis. Returning to Boston, he underwent an operation, from which he is now making a satisfactory recovery. Dick is associated with the Travelers Insurance Company of Hartford, Conn.

Tom Desmond is prominently mentioned frequently in the New York papers in connection with his activities in the New York Senate, of which he is a member. — Just as I was about to send these notes over to the Alumni Office, J. Newell Stephenson called up to say he was in town on his way home to Canada from New York. At my suggestion he came to the office, where we had a nice visit. We lunched together with F. A. Burton, whom Steve had not seen since graduation. Steve tells me that the third edition of Volume IV of "The Manufacture of Pulp and Paper" (McGraw-Hill) is just off the press. Volume III came out about a year ago and Volume V is scheduled for the fall of 1938. Steve has very largely rewritten the third edition of this book, on which he has been working for the past two years.

Last fall, in connection with the convention of the Technical Association for the Pulp and Paper Industries, held at Savannah, Ga., Stephenson took a 4,800-mile trip through the South, visiting paper mills in Florida, Louisiana, Arkansas, and back through North Carolina. While at New Orleans he met George Burt '20, chief engineer of the Celotex Corporation, who was very kind to him. On the trip with Steve was Dr. H. W. Johnston, head of the Forest Products Laboratories of Canada, pulp and paper division. Steve has promised to send to me an account of some of his observations on this trip, which I am sure will be interesting to all of us. — CHARLES R. MAIN, Secretary, 201 Devonshire Street, Boston, Mass. Assistant Secretaries: PAUL M. WISWALL, MAURICE R. SCHARFF, New York; GEORGE E. WALLIS, Chicago.

## 1910

John Wentworth, who is a member of the firm of Metcalf and Eddy, has been elected president of the Northeastern section of the American Society of Civil Engineers. — Tom Saul has been promoted to division engineer of the Southern Pacific Railroad, headquarters at Tucson, Ariz. Tom was located formerly at Fresno, Calif. — John Barnard has taken his son into business with him.

The following appeared in the December issue of *Electrical Engineering*: "S. L. Henderson, Section Engineer for the Westinghouse Electric & Manufacturing Company, East Pittsburgh, Pennsylvania, has been promoted to the position of District Engineer, with offices at New York. A native of Boston, Massachusetts, Mr. Henderson received the degree of bachelor of science in electrical engineering at the Massachusetts Institute of Technology in 1910, following which he entered the test course of the Westinghouse Company. In 1913 he was appointed design engineer and successively became division engineer and section engineer. He was a member of the Institute's committee on electrical machinery from 1928 to 1935 (Chairman 1932-34) and a member of the technical program committee from 1932 until 1934. At present Mr. Henderson is a member of the sectional committee on rotating machinery of the American Standards Association."

H. E. Beebe of Ipswich, S.D., has written an article on library trustees which was published in the South Dakota State Library Bulletin of May. Another article on a trip back to the Atlantic Coast, which includes a visit to Gloucester, appeared in the 1937 annual State Horticultural Society report. — HERBERT S. CLEVERDON, Secretary, 46 Cornhill, Boston, Mass.

## 1911

Mid-February figures in the Alumni Fund show that our Class has so far subscribed \$4,380, contributed by 54 of us, or 14 per cent of the Class. By the time these notes appear, the nation-wide district contests will be just reaching what many of us believe to be a most successful conclusion and if you have not sent along your pledge by the time you read these class notes, please do so at once. We, as a Class, have never been found wanting, and we won't this time. Each one of you who have not yet subscribed will feel lots better if and when you do. As I've told you before, it's nice to hear from you boys always and there is no need to wait for a campaign like this current one to "Write to Dennie": That is the thing to do often.

Dave Allen, II, an old "townie" of mine at Framingham High, sent in a generous contribution, and it will interest you to know that he is still with a very important company in the nation's capital — the Washington Gas Company — else how could Congress function. From out in the northwest territory came two generous contributions in early February: one from Stu Copeland, II, who is with the Northwest Paper Company at Cloquet, Minn.; the other from Otto Shennstone, I, an executive of the Massey-Harris Company, Ltd., for many years located at their Toronto plant but nearly two years ago shifted to the plant at Racine, Wis. Zeke Williams, XI, continues his success with the advertising firm of Erwin Wasey and Company, Inc., in the Big Town and recently added a very generous pledge to the Alumni Fund.

A fine letter is at hand from Charlie



1911 Continued

Barker, VI, my old thesis mate. He comments: "Business is not too good, but we have been rather fortunate and have work enough to keep our regular crew on full time." Charlie, you know, is located in San Francisco as president of the B. F. Sturtevant Company of California. In commenting on the complete and prompt recovery of my big son after his auto accident, thereby paralleling my own case in the fall of 1915, Charlie said: "Apparently you Denisons are just plain tough!"

We certainly are proud of Ted (T.V.A.) Parker, I, being chosen one of five representatives at large on the Alumni Council in the forthcoming election. Also, our Class is represented in District 8, where Don Southgate, IV, of Nashville, Tenn., is one of three candidates for membership on the National Nominating Committee.

Jack Herlihy and I attended an inspiring Alumni Fund Smoker at the University Club in Boston on February 24, on the eve of the big March drive. Our Class showed up reasonably well in the charts arranged and there was one very outstanding feature of our figures, viz., the almost identical degree of interest to date between the members of the Class who are within a 25-mile radius of Boston and those elsewhere in the world. The percentages of those subscribing to date are 14.25 for Metropolitan Boston and 14.29 for outside that area — believe it or not!

So ends a very short set of notes — short because of a momentary dearth of letters from classmates. The remedy is obvious. So do! — ORVILLE B. DENISON, *Secretary*, Chamber of Commerce, Worcester, Mass. JOHN A. HERLIHY, *Assistant Secretary*, 588 Riverside Avenue, Medford, Mass.

## 1912

It is with deepest regret that we note the sudden death of Donald O. Cornish at his home in West Newton, Mass., on February 6. Cornish was apparently in the best of health, having bowled the night previously. — E. L. Lasier has severed his connection with the Titanium Alloy Manufacturing Company in Niagara Falls, and he and Mrs. Lasier went out to their little farm near Hayward, Calif., to spend the holiday season and to look after some of his business interests in the West. At last accounts, the business recession had caused Emery and his wife to decide that they would be better off to spend a little longer time in the West and wait until the economic situation improved before coming back East. This does not mean that Lasier is going to live in idleness, because he has various lines involving sales, service, and consulting work in addition to personal interests in various mineral properties in California. — Please bear in mind that to date, 1912 is below the class average in the percentage of contributors to the Alumni Fund. Even though our contributions are not large, we should be able to make a satisfactory showing as regards percentage of contributors. — FREDERICK J. SHEPARD, JR., *Secretary*, 125 Walnut Street, Watertown, Mass. DAVID J.

McGRATH, *Assistant Secretary*, McGraw-Hill Publishing Company, Inc., 330 West 42d Street, New York, N. Y.

## 1913

Our 25-year reunion committee is busy and doing a good job. Bill Mattson, chairman, wrote on February 23: "We have made final arrangements for the next class dinner, which will be held at the University Club in Boston on Saturday, April 2. Due to the interest shown at the last class dinner, we anticipate a large and enthusiastic turnout. The 1913 headquarters during the reunion will be at the Hotel Commander in Cambridge. The class banquet will be held at that hotel on Saturday, June 4, and on Sunday, arrangements have been made for a trip to the Kernwood Golf Club in Salem. Our activities on the following Monday and Tuesday will be largely regulated by the M.I.T. reunion committee in connection with the graduation exercises at that time."

"As some of the members of the Class may arrive in Boston a few days before the official reunion, we will maintain our headquarters at the Commander Hotel throughout the week of May 30 to June 4. If there is sufficient interest, preliminary parties may be arranged in or around Boston during the early part of that week. We urge our classmates to bring their wives with them, as special entertainment will be available for the ladies. On Saturday noon, June 4, there will be an informal luncheon for men and ladies at the Commander Hotel. That evening while the men are at the class banquet, a theater party will probably be arranged for our lady guests. On Sunday, we contemplate for the ladies a trip to the North Shore, after which they will return to the Kernwood Club, where they will join the men for dinner and the return trip to Boston that night. The ladies will also be able to take part in the activities at M.I.T. the following two days."

Our Charles Edison is much publicized, but the following article from the *New York Sun* of December 31 is plenty good enough to reproduce here: "This is the story of a Christmas present that made a round trip. On trustworthy authority this writer has the story that Mayor Frank Hague of Jersey City handed Charles Edison a brand new United States senatorship, and that Mr. Edison, who is the Assistant Secretary of the Navy, handed it right back. The Yuletide package was the senatorial post of Governor-elect A. Harry Moore. According to my informant Mayor Hague invited Mr. Edison to his office and broke the good news. The Mayor was astonished when Mr. Edison tactfully indicated that he was not interested. All efforts at persuasion failed, and Mr. Edison stays on his navy job, which looms bigger every day, as the President indicates a policy of considerable naval expansion. In his year's service in the department Mr. Edison has worked vigorously and effectively and there is much talk of his being the next Secretary of the Navy."

"There is one episode in Mr. Edison's mainly untroubled past which would make Mayor Hague turn in a riot call, rather than offer him a senatorship. The imaginative and idealistic young son of Charles Alva Edison did a year's stretch in Greenwich Village when he finished at M.I.T. He bank-rolled Guido's weekly, a journal published in the challenging spirit of the time and place, with Guido Bruno, one of the leading challengers of those parts. He ran a thimble theater, wrote poetry, played the piano, collected rare books, took a look at dadaism and post-vorticism and mixed with the literati and lazzaroni in that now fading zone of high cultural sensitivity. They soon caught him at it and got him back in the lockstep. He lacked his father's genius in invention and technology. That mantle fell on his younger brother, Theodore ['23]. But, at the age of 33, Charles Edison was running thirty-three Edison corporations. He became Assistant Secretary of the Navy a year ago. He has liberal intellectual interests, resembling his late father in appearance, and explores a wide field of ideas in economics and governmental administration. He is regarded as an excellent business executive and was a member of the New Jersey NRA board. His absorbing interest now is in the enlisted men of the navy." — FREDERICK D. MURDOCK, *Secretary*, Murdock Webbing Company, Box 784, Pawtucket, R.I.

## 1914

Your Secretary does not receive a commission for advertising the New York World's Fair of 1939, but he has been so inspired by the part that Homer Calver is going to play in the educational exhibits that he cannot resist taking this occasion to call these proposed exhibits to the attention of the Class. Through Calver's public health work he has quite a collection of titles, one of the most important of which is secretary and director of the Committee on American Museum of Hygiene of the American Public Health Association. Because of this activity he also finds himself as secretary of the executive committee of the Advisory Committee on Medicine and Public Health for the World's Fair, and just to see that he is kept busy, he has been made responsible for the development of the medical and public health exhibits at the fair.

That this is no small task should be evidenced by the fact that over 80,000 square feet of space have been set aside in the center section of the fair for medical and public health exhibits. It is the first time in American fair history that a whole building has been assigned exclusively for such use. In order that the emphasis will not be on the exploitation of any particular companies or their products, the exhibit is not going to consist simply of space rented out to companies but rather a presentation based on subject matter. Calver plans to have his building divided into three separate sections; namely, the Hall of Man, where the anatomy and physiology of man will be

## 1914 Continued

shown; the Hall of Medical Science, where the treatment of various diseases will be depicted; and the Hall of Public Health, which will cover a variety of fields varying from care of children, mental hygiene, food supply, to municipal sanitation. When Calver, with his well-known conservatism, is willing to state that this will unquestionably be the greatest public health exhibit that has ever been shown at any fair, I think we can take the fact as a certainty. It is expected that it will take about \$2,000,000 to carry out the program. Some of the material will be provided for by the Oberlaender Trust, on whose behalf Calver selected it from the German Museum of Hygiene at Dresden in the summer of 1936. Also, a considerable amount of the material will be transferred at the end of the fair to a permanent museum in New York City.

Frank Somerby, who is on the staff of the Buckley School in New York City is one of a special committee of the Secondary Education Board studying the problems of private schools. He is also on their science committee, which has been studying and is suggesting courses in science for such schools. Many of these secondary schools have been quite weak in their science preparation, and with the ever increasing importance of science, not only for those entering technical institutions, such as M.I.T., but for higher education in general, it is important that more emphasis be given to well-organized courses in secondary schools.

Harold Bent was one of a group of Technology men of the peninsular district of Virginia who met to discuss the possibility of organizing a local Technology Club. There are nearly 100 Technology men in the district, a large proportion of whom are at Langley Field, Fort Monroe, or with the Newport News Shipbuilding and Dry Dock Company, where Bent is superintendent of the steel hull division. Bent writes that he would be eager to greet any members of the Class who may be passing through that section of Virginia.

At the January meeting of the Alumni Council, Chet Corney, who is the representative of the Technology Club of Northern Texas, had his son, now an Institute freshman, with him as guest. This is the first time a '14 man on the Council has had this pleasure, but from the number of sons of those members actually at the Institute or scheduled for it in the next few years, '14 could go a long way toward establishing a Technology father-and-son group. — It looks as if Herman Affel were out for the class patent record. Another on a vacuum tube circuit has just been granted him. — H. B. RICHMOND, *Secretary*, General Radio Company, 30 State Street, Cambridge, Mass. CHARLES P. FISKE, *Assistant Secretary*, 1775 Broadway, New York, N.Y.

## 1915

"When good fellows get together" should come to mean more to us now than ever before, at the time when we must be good fellows and we must get to-

gether to help Tech in the Alumni Fund Campaign. Here are the 1915 statistics as of February 21: 50 men have subscribed \$4,705, an average of \$94.10 per donor, or \$9.96 per capita. This is 10.6 per cent of the Class. These figures compare favorably with the all-alumni totals. In fact, we are 10 per cent higher than the average subscription per donor, but it is no consolation to be of the average. Send your check now.

A short time ago we had a luncheon for the Fund Committee to contact all class members in the Metropolitan Boston area, and in the present campaign we shall all become more active. The Committee joins me in urging you to send in your subscription at once. No matter what you send, it will help and it will give you a personal satisfaction, having done your part in this most worthy and noble cause.

Alumni Day this year will be on Monday, June 6. The Class will hold a cocktail party before the Alumni Dinner that night and, boys, it will be free. You will be notified about it in plenty of time, so you can come and bring your guests. Let's get together for a good time that night.

On Wednesday, February 16, at Walker Memorial, we had a class dinner. An unusually good attendance — 27 men — gives continued evidence of the interest, loyalty, and activity of our classmates in class affairs. Here they are: George Rooney, Bert Adams, Henry C. Sheils, Wayne D. Bradley, Frank F. Foster, Frank E. Murphy, Harold L. Colby, Horatio W. Lamson, Max I. Woythaler, Jac Sindler, George J. Moulton, Charlie G. Norton, Archie S. Morrison, Ben Hurvitz, Frank J. Herlihy, Weare Howlett, Clive Lacy, Bob Warren, Edwin B. Goodell, Jr., Wally Pike, Loring Hayward, Carl Wood, Herbert Swift, Marshall Dalton, Azel Mack, Easty Weaver, and Johnny O'Brien, of course.

Some of the regular attendants were necessarily absent because of unexpected engagements or unavoidable illness. We opened the dinner with a regular M.I.T. cheer with three "Daltons" as a fitting greeting and salutation to Marshall Dalton, President of the Alumni Association. With the same strength of numbers demonstrated in undergraduate days, Course I led in the men present with eight, that is, without counting Johnny O'Brien, of course, who would make Course I attendance only 7½. We were glad to welcome Gabby Goodell as a newcomer. We hadn't seen him since graduation, and it was awfully nice to have him with us. Wayne Bradley gets the distance prize for coming to the dinner from Bridgeport, Conn. Horatio Lamson, George Moulton, Ben Hurvitz, and Clive Lacy were others whom we hadn't seen for some time. The refreshments were furnished by generous classmates, so that this part of the dinner was no expense to the class exchequer. We have never run these dinners with any formality, but an occasion like this was worthy of having George Rooney as toastmaster, and despite the disturbance

from uncouth, possibly envious diners, George did a marvelous job with the introductions.

First, Jack Dalton gave us a serious talk on the present Alumni Fund Campaign, stressing the undergraduate needs for the new facilities. He spoke also of the Institute's curricular expansions and the problems surrounding the disposal of the Boylston Street properties. It was indeed a pleasure to have Jack talk to us from the standpoint of his position as president of the Alumni Association, with his understanding of these vital Institute problems. — Herb Swift, always loyal in coming down from New London, N.H., showed all the movies of the 20th reunion at Saybrook, plus the colored movies of the dinner in March, 1936. It is really amusing to see oneself in movies. Herb supplemented these pictures with an artistic appeal to "Help Azel" with class dues. Because of the wives and families who read these notes, perhaps the less said about these pictures the better.

When the very pertinent wisecracks subsided, we had a most unusual hour of delightful, mystifying, interesting entertainment by Bert Adams, former President of the American Magicians Society. He gave us a magic show, and superlatives fail me to tell you properly about this show. Bert began with some elementary tricks, which certainly put us in a very receptive frame of mind, and then went on to mystify us completely with some startling performances. There was none of the familiar rabbit-in-the-hat or mechanical-contrivance tricks but the real deception of the eye and the mind. The most complimentary tribute to Bert is that upon the completion of his show we all remained silent, overwhelmed. After a burst of applause, Bert obliged us with an encore.

These three events made an unusual and splendid program, and I am sure if we model our future dinners along these lines, we shall continue to hold the record of having the biggest and best class dinners held in Walker Memorial. Please, now, do two things: First, send your check to the Alumni Fund, and second, "Help Azel" with class notes. — AZEL W. MACK, *Secretary*, 40 St. Paul Street, Brookline, Mass.

## 1916

Your Secretary had hoped to be able to report concerning many classmates who must be taking winter cruises or trips to Florida. Certainly the dearth of information would indicate that the majority are taking a midwinter vacation. As a matter of fact, we do know that our Class Treasurer, Hovey Freeman, sailed on February 26 on board the S.S. *Britannic* for a winter cruise to South America. We understand this is his first real vacation in about ten years. Of course I do not know what he means by a "real vacation." Hovey certainly looked happy, healthy, and prosperous at our last reunion. Incidentally, he has been elected to the Executive Committee of the M.I.T. Alumni Association.



1916 Continued

Saul Makepeace of Providence, R.I., has found time enough to build himself a shore cottage on Buzzards Bay. Doubtless he intends to invite many of his classmates to a famous Rhode Island clambake sometime this summer. — Theron Curtis is still with his Providence bank, where we understand he has been given larger and greater responsibilities in the bank's real estate department. — Cy Guething, who is with the Heald Machine Company at Worcester, Mass., spent some time in Houston, Texas, early in February. While there he spent an evening with Kem Dean. The latter, as you know, is in the cotton trade and is very much concerned about the effect on his business of the recently enacted farm bill.

Harold Gray, I find, is vice-president of the Benedict Manufacturing Company in East Syracuse, N.Y. He has been in his present work for about five years, in charge of the operations of a plant employing about 200 people, making a line of plated silverware for the hotel and restaurant trade, which is largely hollow ware, as distinguished from flatware. Harold, by the way, has just been elected president of the M.I.T. Club of Central New York, with headquarters in Syracuse, which means that he has considerable responsibility for the Alumni Fund Drive in that part of the state.

As these notes are written, members of the Class may be interested to know that 55 of our members have so far contributed to this fund. If you have not sent your check or filled out your pledge by the time you read this notice, please do so now. — JAMES A. BURBANK, *Secretary*, The Travelers Insurance Company, Hartford, Conn. STEVEN R. BERKE, *Associate Secretary*, Coleman Brothers Corporation, 245 State Street, Boston, Mass.

## 1917

From the *Exonian* of the Phillips Exeter Academy the Secretary learns: "Dr. Perry has announced that Mr. Philip Edwin Hulburt, Academy mathematics and mechanical drawing teacher, has been appointed chairman of the mathematics department. Mr. Hulburt, whose term begins in September, 1938, succeeds Mr. George H. Selleck, present head of the department, who will retire this June.

"Mr. Hulburt was born in Cambridge, Vt., and received his early education in the Brookline, Mass., public schools and the Boston Latin School. In 1912, he entered Exeter, graduated in June, 1913, and entered M.I.T., where, in 1917, he received the degree of Bachelor of Science in architectural engineering. Two months after his graduation, he was commissioned a second lieutenant in the Coast Artillery. In October, 1917, he was commissioned a first lieutenant, and in March, 1918, he became a captain in the Coast Artillery Corps. He also served with the American Expeditionary Forces until the end of the war.

"In October, 1919, Mr. Hulburt was appointed instructor in mathematics in the Academy, and, in 1927, he also be-

came instructor in mechanical drawing. Since 1925, he has been living in Wentworth Hall. Mr. Hulburt first taught in the Summer Session in 1923, and in the following eleven years served continuously. In the fall of 1936, he was appointed chairman of the Summer Session faculty. Mr. Hulburt has been a member of the executive committee and the admissions committee of the Academy. He has been examiner in mathematics for the Secondary Education Board and member of the Committee of Review. With Mr. Butterfield, he is the author of *Outline Course in Plane Trigonometry*. The Pean of 1937 was dedicated to Mr. Hulburt and also the 1937-38 E book."

Word has been received here of the engagement of Benjamin S. Wells of San Francisco to Miss Lucille Thomson of Berkeley, with the wedding planned for the early spring. — Philip Rowe was recently reelected president of the United States Shellac Importers Association, with headquarters in New York.

Richard T. Whitney is now Western advertising manager of the *Redbook*. The McCall Corporation, publishers of the *Redbook Magazine*, *McCall's Magazine*, *Blue Book*, and other periodicals, announced on February 28 Far's appointment with headquarters in the Palmolive Building in Chicago: "Although a native Chicagoan, Mr. Whitney has spent a great deal of his business life away from that city. In January, 1930, he joined *Redbook Magazine*, a few months after it had been purchased by the McCall Corporation. Since that time he has continuously served as a member of the advertising staff of this publication with headquarters in New York. Prior to his connection with *Redbook* and the McCall organization, Mr. Whitney was for five years advertising manager of the Hood Rubber Company, Watertown, Mass. Educated at the M.I.T., Mr. Whitney is a graduate of the Class of 1917. During the World War he served as a lieutenant in the United States Naval Aviation forces." — RAYMOND STEVENS, *Secretary*, 30 Charles River Road, Cambridge, Mass. PHILIP E. HULBURT, *Assistant Secretary*, Phillips Exeter Academy, Exeter, N.H.

## 1918

Learning to run a slide rule was, for us, a little like swimming in a bog. With a twinge of distrust we verified, by fourth grade arithmetical processes, every move of the slide. By a nice exchange of courtesies the slide rule now enjoys a heart-warming confidence, whereas . . . but never mind that. Tom Brosnahan has made it possible to carry a slide rule in every pocket. Under the sumptuous letterhead of the distributing office of S.S. Kresge, he writes: "I am presenting you with an 'honest to goodness' slide rule, which we sell for 25 cents. It will not arrive in an expensive case, and it will not have the white surface that is found on rules selling for six or seven dollars. However, I believe it is practical for general work, especially for students and others who can use the difference in cost to very good advantage.

"The S.S. Kresge Company is the sole distributor, and the demand has been so great that the manufacturer has been unable to keep up with it. Orders and reorders have piled up and some stores have not yet received the first shipment. This is rather unusual during a period of recession. It is a case of 'he who produces a better value than his neighbor, even though it be only a mousetrap, will have a well-beaten path to his door.' Price in this case is the dominant factor in the value, rather than appearance and fancy trimming. I thought you would be interested in this slide rule as an example of what can be offered to the public on the basis of mass production and economy in distribution."

We have several comments to make in hushed tones: First, the financial socializing of logarithmic scales is a real achievement and the instrument exactly the thing for hard use or instruction of the exuberant adolescent. We tried it. Second, we wonder whether Tom would have misquoted Emerson had he known that the more elegant original had been first uttered in the softening atmosphere of a lecture delivered by the Concord essayist before the ladies of the First Unitarian Church of San Francisco in the spring of 1871. Third, Dr. Emerson clearly made an overhasty generalization, for no matter how good the trap, there will be no path unless (1) the world has need of catching mice, and (2) unless the world knows about your old trap. This last requirement prompts us to sing the praises of Tom's 25-cent rule in lines, the sheer music of which should seduce you into forgetting that it is pure advertising.

Now for a spasm of concentration on the reunion. Another edition of the "Eighteenth Amendment" is positively going to be published. So get out the memories of the last decade that you are saving like pressed flowers — sweet, cherished, and withered — write your letter, and send it (if you want a copy) to the Class Secretary with a check for two dollars. Better to write yourself than to trust what he will make up about you between now and the five o'clock whistle.

The new edition of the Amendment is rumored to contain stories of who stole Charlie Cross's handkerchief; how many of us earn over \$50,000 a year; which class officers have never been arrested; whether or not anyone really did stick a thumbtack into Professor Currier's wooden leg; how many classmates have shot giant pandas; how many of us have Chinese children; and who's ahead on his old-age pension payments. Rumor rides on every wind.

We had hoped to make a breathless announcement in this issue of the dates and place of the reunion, but the committee has not yet achieved that felicity of selection, which will leave us in a frenzy of anticipation. One difficulty is due to the exquisite pang of needing facilities for a crowd of over a hundred!

We record with deep regret the death on November 15 of George Hutchings, Jr., at St. Petersburg, Fla. — Whether



## 1918 Continued

laden with loot or lares and penates, classmates are constantly on the move: Shorty Carr now receives his mail at 368 Prospect Street, South Orange, N.J.; Harold Fitch at 74 Brookline Avenue, Albany, N.Y.; Bernard O. Pinkham, 130 Woodland Avenue, Winnetka, Ill.; Sherwood Taber, 824 Doan Drive, Burbank, Calif.; Edward N. Winslow, 16705 Lomond Boulevard, Shaker Heights, Ohio (and, believe me, the coin has to shake painfully if you want to reside in that resplendent town!). — F. ALEXANDER MAGOUN, *Secretary*, Room 5-117, M.I.T., Cambridge, Mass. GRETCHEN A. PALMER, *Assistant Secretary*, The Thomas School, The Wilson Road, Rowayton, Conn.

## 1919

Thanks to J. Henderson Butler we received the following interesting piece of class news from Columbus, Ohio: "R. R. Litehiser, chief engineer of tests of the Ohio State Highway Department, has announced his acceptance of the position of director of engineering of the New York State Crushed Stone Association at Albany, N.Y., on March 1. During the eight years Mr. Litehiser has been chief engineer of tests, the Ohio State Highway Testing Laboratory has assumed an outstanding position in its field. Mr. Litehiser is a member of the American Society of Civil Engineers, being president this year of the Central Ohio section of this society. He holds important committee assignments in the American Society for Testing Materials, Highway Research Board, and the American Association of State Highway Officials. He is a member of the Ohio Society of Professional Engineers and past president of the Engineers Club of Columbus and of the Technology Club of Central Ohio. Mr. Litehiser also holds a major's commission in the 323d Field Artillery of the Organized Reserve."

On a recent trip to New York City your Secretary ran into W. H. Bassett, Jr. Bill is manager of the metallurgical development department of the Anaconda Wire and Cable Company at Hastings-on-Hudson and was returning home from an engineering society meeting in New York City. We had a very interesting chat during the train ride out to Bronxville, where I was staying a few days with friends. On this same trip I bumped into Al Reynolds sipping a cocktail with Mrs. Reynolds at the Old Brass Rail in Times Square. I had not seen Al since graduation and spent a very pleasant few minutes recalling old times. He has been with the Bell Telephone Laboratories since graduation.

Due to being up to my ears in the considerable detail involved in forming my own company, for the purpose of becoming a manufacturers' representative and also dealing in pyrometer supplies, I slipped up on sending in any notes last month. So if the next two or three months' notes appear below even the customary low standard (if such a thing is possible), you will know the reason. Incidentally, it wouldn't do any harm to

send in news about yourself so that there would be something to go into the notes, as my psychic and literary powers are conspicuous by their absence. It will be out of the question for me to do any considerable amount of traveling about the country to permit personal interviews with members of the Class, pleasant and interesting as this proved to be in New York. — ARKLEY S. RICHARDS, *Secretary*, 26 Parker Street, Newton Center, Mass.

## 1920

As this issue of The Review goes to press, we receive word from Scottie Wells. After 12 years of married life, Scottie was almost incoherent with excitement about the arrival of his first child, a daughter, Barbara Bigelow Wells, born, according to Scottie, at eight minutes past nine P.M., on Saturday, February 12. Scottie says he thinks the New Deal ought to throw out all these unimportant projects and do something about the proper care of expectant fathers. Congratulatory missives may be addressed to 24 Pinecrest Road, Newton Center, Mass.

I ran into Tony Anable in New York recently. He is as handsome and debonair as ever and is still running the sales promotion department for the Dorr Company. Tony said that he saw Pete Ash and Phil Young more or less regularly and used to see George Corcoran until he moved South.

Leland Gilliatt has left the state of Maine and is back in Massachusetts, where his address is 81 Shirley Street, West Quincy. Ted Hobson has moved from Lowell to 125 Oxford Road, Newton Center, Mass. Lee Thomas is now with Economy Pumps, Inc., Hamilton, Ohio. Will Boyer is in San Antonio, Texas, at 368 Club Drive. George I. Brown has moved from Wabash to Anderson, Ind. Bill Ireland is in Detroit, at 5734 Devonshire Street. Harold Seavey is now living at 124 Cedar Street, in Braintree, Mass. As far as I know, Harold is still in the upholstery business. Tom Orchard has moved from Worcester to Providence, where his address is 73 Sea View Avenue.

Your Secretary gets over to the Institute every week, as he is still conducting his course in advertising for Course XV graduate students and seniors. I can assure you that the quality of the boys is holding up to a very high standard. Maybe they are not quite up to the boys of Course XV, 1920, who were, of course, far ahead of those in other Courses, in mental and social brilliance, but they come pretty close to it. — HAROLD BUGBEE, *Secretary*, 7 Dartmouth Street, Winchester, Mass.

## 1921

We have it on good authority that the Institute has gone back to the soil and is teaching agriculture — at least our good authority states that that journal of eminence, the *Boston Traveler*, so reports. The way we got the story, a recent headline told the waiting world that the Institute's "Department of Agriculture"

is being moved from Boston to Cambridge! The April 1 date of this issue is so appropriate for the story that we can't resist rushing it into print ahead of tall, dark, and handsome Clayt Grover, 1922's live-wire scribe, who told us about it!

You have all received another letter, showing the extent to which the Class has participated in the Alumni Fund Drive. May we add our sincere thanks to those who have so splendidly endorsed the Institute's program. Those who have not yet sent in pledge cards are earnestly asked to do so now. Let's do our share in providing the worth-while new facilities which are so urgently needed. Won't you be as generous as you can and as prompt as possible in reporting to Cambridge what you will contribute? Don't wait — dig out that card at once and mail it today!

Via Dan Harvey and Ray St. Laurent, we learn that Jack Kendall is now manager of the Bekins Van Lines, Inc., with main offices at 1335 South Figueroa Street, Los Angeles, Calif. Jack says that Stuie Nixon has given him such a swell report on our 1936 reunion that he is planning now to be among those present at the Tremendous Twentieth in 1941. Dan drove to the Coast last year and just missed seeing Jack, who was in his usual form, running a convention of his company's representatives in Fresno!

In a recent issue we announced the engagement of Charlie Pool, chief engineer and chemist of the Rhode Island Public Health Commission, Providence, R.I. Comes now a most welcome communication: "Mrs. Edwin Cyrus Hopkins announces the marriage of her daughter, Ella Lavina, to Mr. Charles Lundy Pool on Saturday, January eighth, Greenfield, New Hampshire." Heartiest congratulations! — It was with deepest regret that we read in the February issue of The Review of the passing of Donald Atherton Robbins on December 29. To date no details have been received from the Alumni Office. Don was sales engineer for the Cooper-Bessemer Corporation of Mount Vernon, Ohio. He was 39 years old and a native of Brookline, Mass., where he prepared for the Institute at Brookline High School. A graduate of Course II, Don was a member of Theta Chi and was active in undergraduate circles, including the Mechanical Engineering Society, Technology Athletic Club, track team, cross-country team, and Tech Show. On behalf of the Class we extend sincere sympathy to his family.

Eight of the Class were present at the February smoker of the M.I.T. Club of Northern New Jersey: Max Burkett, Bill Emery, Sumner Hayward, Gene Kennedy, Fred Kowarsky, Bob Lockwood, Ralph Wetsten, and Cac Clarke. Ralph was a member of the committee in charge of the meeting and also helped to furnish the musical program, while Sumner was one of the victims of the prestidigitator's machinations. Pip Coffin is on the committee arranging the April banquet.

Does anyone know the whereabouts of the classmates whose last known addresses follow? If so, please notify the

1921 Continued

Register of Former Students at M.I.T., so that returned mail can be forwarded to these men: Herman Broockmann, I, Church Street, Richmond Hill, Long Island, N.Y.; Herman F. Finch, II, 12 Tip Top Street, Brighton, Mass.; Max Goldberg, VI, 118 Acushnet Avenue, New Bedford, Mass.

Recent changes of address include: Albert B. Alsos, XIII, 908 Carpenter Street, Brunswick, Ga.; Charles A. Cassell, III, 5303 Kimbark Avenue, Chicago, Ill.; Joseph H. Guild, I, Salem, N.Y.; Thomas F. Hickey, II, 49 Julian Street, Dorchester, Mass.; Fred R. Kingman, Box 4277, Philadelphia, Pa.; Robert E. Manley, X, 537 Palisade Avenue, Yonkers, N.Y.; Rollin F. Officer, XV, care of Mrs. Stanley C. Sears, 2230 California Street, Washington, D.C.; John W. Scott, I, 415 Cobbs Hill Drive, Rochester, N.Y.; Harry Victor, IX-B, 135 West 79th Street, New York City.

Please don't forget to return that Alumni Fund pledge card. And don't let the recession take its toll in the class notes section; we need your news to stay in the parade. Write now! — RAYMOND A. ST. LAURENT, *Secretary*, Rogers Paper Manufacturing Company, Manchester, Conn. CAROLE A. CLARKE, *Assistant Secretary*, 10 University Avenue, Chatham, N.J.

## 1922

Chicago forges ahead with a class organization to promote frequent local reunions, to act as hosts to visiting class celebrities, and to convene for any other convivial purpose. At the initial meeting in November, the following officers were elected: President, Al Browning; Vice-President, Tom Alder; Treasurer, Ab Johnson; Secretary, Fred Burt. Others in attendance were William Bainbridge, Charles Brantingham, Ray Ellis, Albert Houston, Charles Pope, Jr., Robert Kahn, Edwin D. Martin, Roger McMullen, Jr., Felton Metcalf, James Norton, Harry Pearson, Conrad Ronneberg, and Bertram Weber. More power to the Chicago gang. Why not the same thing in some of the other larger centers?

Karl L. Wildes has temporarily forsaken his duties at the Institute to lecture at National Tsing Hua University in Peiping, China. He and Mrs. Wildes journeyed to Peiping via Europe and Russia and plan a transpacific return next August. We hope Karl will give us ample notice in the event it becomes necessary to send an armed contingent of the Class to China to get them safely back to the United States.

A letter to Professor Locke '96 from George Buttler, Jr., III, tells of various ups and downs during the past few years in Mexico. In 1930 he was superintendent of the Jimulco mines with an interest in the profits. He was on easy street, bought a house in Torreon, and the depression did not mean anything to him. Three boys were born during this period and they are now in private school in Torreon. The Jimulco mines shut down in 1931, and, after that, Buttler went into partnership in the business of drilling wells. This was

very profitable at the start but later on was about an even break and finally went on the rocks. Buttler spent five months as superintendent at the Ahumada mines in Chihuahua, but the financial situation there became too bad, and he moved to Velardena, where he took a sublease on the San Mateo mine. This is giving him plenty to do. The prospects look encouraging, but he says he is having plenty of fun, and success is not absolutely assured.

We learned with regret of the death of Walter Driscoll, XV, following a heart attack in Rio de Janeiro, Brazil, on January 30. Walt was on a cruise to restore his health, accompanied by Mrs. Driscoll. He was vice-president of the Northwest Paper Company, Cloquet, Minn., and a life member of the Alumni Association. We extend the sincere condolences of the Class to his family.

The Boston newspapers in October carried news of the engagement of Christian Bertelson, XIII, to Miss Ocea Lylve Cameron of Dedham. — At the time of writing these notes, 143 of our Class have contributed nearly \$8,000 to the Alumni Gymnasium Fund. It is going to take added effort from all of us to put 1922 out in front. Let each who reads this notice make sure that he has sent in his pledge and then take the responsibility on behalf of the Class and of the Institute to get someone else to do likewise. — Assistant Secretaries, please observe that recession or no recession more and bigger news from the class districts is the order of the day. — CLAYTON D. GROVER, *Secretary*, Whitehead Metal Products Company of New York, Inc., 304 Hudson Street, New York, N.Y. — C. YARDLEY CHITTICK, *Assistant Secretary*, 77 Franklin Street, Boston, Mass.

## 1923

The Boston *Evening Transcript* carried, in January, the announcement of the engagement of Mason Dix Harris, XIII-A, to Miss Zaydee Dejonge, art teacher of Fitchburg, Mass. Harris came to Technology for postgraduate work from the United States Naval Academy, where he was crew captain. After leaving the Navy in 1926, he went to the oil fields of Oklahoma, and is now with the Tide Water Pipe Company, Ltd., of New York City.

Jack Keck, X-B, reports a goodly delegation of 1923 men among those present at a smoker of the M.I.T. Club of Northern New Jersey on February 9. In addition to himself, he states that the following were present from '23: T. H. Boyd, XIII; C. V. Chamberlin, IV; W. S. LaLonde, Jr., I; William J. Lutz, II; Miles Pennybacker, VI-A; C. E. Roche, V; E. J. Thimme, VI; L. L. Tremaine, II; and H. J. Verner, II.

I recently had occasion to take to task one of those on the foregoing list: Miles Pennybacker. I told him I felt that in some particular he must have failed to take advantage of the more than 40 years of experience of the organization for which I work (the National Fire Protection Association). Miles had a fire recently and now his business (Votarc Tubes, Inc.) is in new quarters at 21

Beach Street, Newark. He kicks in the following advertising in a recent letter: "In addition to our electrodes for neon signs, we now make a complete line of rare gases and are about to bring out a line of tubes coated with fluorescent material to take advantage of the ultraviolet in the mercury spectrum."

Bill Cauldwell, XV, writes from New York, that he is with the Department of Public Welfare, where, as employment manager, he says he is supposed to give out jobs. His young hopeful, Bill Junior, aged 12 years, is practicing for the Tech tennis team, and may, for all I can tell from Bill's report, be beating the pants off the old man at the game, since the latter reports that his own game has fallen off so that now he is doing well to play a full set under the noonday sun.

Miles Pennybacker (bet you thought I was all through with him for this month) also reported that the '23-'24 annual dance of the New York group was scheduled for the Hotel Taft on February 11. Furthermore, he is one of many who have said that they were looking forward to the 15th reunion.

Our President has been in correspondence with your Secretary and has decided that there ought to be a reunion — if he can get someone else to run it — preferably someone in Boston. And your Secretary expects to write back to Bob Shaw shortly telling him that he thinks the President ought to run the reunion. So, if the project doesn't fall between these strenuous efforts to pass the buck, there will be some announcement issued in due course. — HORATIO L. BOND, *Secretary*, 18 Jefferson Road, South Braintree, Mass. JAMES A. PENNYPACKER, *Assistant Secretary*, 96 Monroe Road, Quincy, Mass.

## 1924

From Los Angeles this month comes word of the election of Bill Robinson as president of the Technology Club of Southern California and also as chairman of the Alumni Fund Committee for that area. Both of these jobs bring him the congratulations and good wishes of the rest of the Class. Many other members are also active on the West Coast, including Sam Graham, who is city engineer for Sierra Madre; Rock Hereford, financier with the Pacific Finance Corporation of California; Phil Herrick, a leading wholesale drug specialist; Royce Greatwood, recently back from the Orient and now representative of the Union Oil Company of California; and Archie Carothers, Harold Clarke, Fran Jenkins, and others, who are regular attendants at club functions.

Si Simonds, still traveling the globe with the Dollar Line, has come through with a sterling idea for the 15th reunion, which we'd almost forgotten is due to arrive in 1939. Si's idea is that members of the Class who have 16-millimeter movie cameras should get pictures of as many classmates as possible, so that they may be combined for the reunion. To start the ball rolling, Si already has shots of Bill Robinson and Archie Carothers, taken in Los Angeles, of Harold Young at San



## 1924 Continued

Francisco, Joe Young at Shanghai, and a few more. It sounds like a grand idea, and the Secretary will be glad to receive any shots for splicing into a reunion film.

As a front-rank contender for the title of head of the largest family, we believe Paul Cardinal should be in line for some sort of reunion prize, for Paul has just written to announce the arrival, on February 6, of a baby girl. Added to Paul's previous acquisitions, that makes a round half dozen, evenly divided. Are there other contenders for a prize?

Bill Correale reports on the annual dinner dance at the Hotel Taft in New York, attended by himself, Anatole Gruhr, George Arapakis, Gordon Harvey, Malcolm MacNaught, Perry Maynard, Roland Black, Nathan Schooler, Ike Brimberg, Frank Hecht, and Bill Sturdy. Perry Maynard, we hear, has been transferred to Detroit for an extended period.

At an Alumni Fund Smoker held at the University Club in Boston on February 24, the Secretary enjoyed an evening with George Knight, Chick Kane, Herb Stewart, and George Neitlich—all members of the Boston committee.—FRANCIS A. BARRETT, *General Secretary*, 50 Oliver Street, Boston, Mass.

## 1925

By various methods a few notes of interest have been gathered during the past month. Direct correspondence from members of the Class has been almost nil since the first of the year, despite the fact that your Secretary has written quite a number of letters following up the class letter of last October. Certainly there must be some class spirit still alive among you. How about a little coöperation in keeping 1925 in this column.

There are two weddings to report: On January 29, Louis Long, Jr., X-A, was married to Miss Helena Thompson, daughter of Mrs. Henry S. Thompson of Fairhaven Hill, Concord, Mass. The wedding took place at four o'clock in the Leslie Lindsey Memorial Chapel of Emmanuel Church in Boston. Rev. Arthur Lee Kinsolving of Trinity Church performed the ceremony. A reception was held at the home of the bride's uncle and aunt, Mr. and Mrs. Frederick J. Bradlee at 211 Beacon Street. Following their wedding trip, the couple will make their home in Cambridge.—George W. Humphrey, VI, of Louisville, Ky., was married on February 22 to Miss Harriet Talcott Clark, daughter of Mrs. Talcott H. Clark of Garden City, Long Island. The wedding ceremony took place at the Church of the Ascension, New York City.

The New York *Times* of February 17 carried a picture of the world's largest atom smasher now under construction at Harvard University and showed one of the men in charge of this work, Kenneth T. Bainbridge, VI-A, assistant professor of physics. This 100-ton cyclotron is designed to permit the most precise calculation ever made of the forces released by atomic disintegration. It is probable that the cyclotron will be put into operation by early summer, and it is expected to generate about 8,000,000 volts. Working

with Dr. Bainbridge at Harvard are other members of the physics staff and of the department of communication engineering.

Edward B. Jennings, III, was one of many Technology Alumni encountered at the annual meeting of the American Institute of Mining and Metallurgical Engineers held in New York, February 14 to 17. This was the first time I had seen Jennings since 1925, and in that time he has covered a great deal of territory as a geologist and mining engineer. Since 1931 he has been associated with the Universal Exploration Company, a subsidiary of the United States Steel Corporation. With this company he has been on a variety of jobs, including geological examination, mine examination, drilling projects, and any other thing pertaining to mining, metallurgy, or geology on which his company desired a report. At the present time he is working in the northwestern portion of New York State and with his wife and family is residing in Gouverneur, N.Y.

A brief note from J. G. Creveling, XII, informs me that since his return from Bolivia, he is living in Birmingham, Ala.—A number of brief items concerning members of the Class have been brought to my attention: Richard M. Wick, X, of the United States Bureau of Standards, is at the Naval Aircraft Factory in Philadelphia; Theodore M. Kuss, I, who has been located at Balboa, Canal Zone, is back in the States, living in San Francisco; Ellsworth S. Gray, II, professor of mechanical engineering at the University of Missouri, has returned to Columbia, Mo., after a sojourn at Purdue University; W. Philip Goembel, aeronautical engineering, who at last reports was at Chipewa Lake, Ohio, now informs us he is in Baltimore, Md.; Nelson Luiz do Rego, XV, for whom we have had no address for several years, turns up at São Paulo, Brazil.—A rather belated announcement has just reached me of the death of Arthur C. Perrin on December 19, 1936, at Fort Sam Houston in Texas.

Ken Lucas, I, reports that he has not heard from other members of the Course but, instead, begs leave to submit some news about himself: He has finally left the state of single blessedness(?). The wedding took place on February 14 in Reading. (Note romantic date.) The bride was Miss Doris Demars of Reading. Ken also reports that he has gone into the map business. He is putting out a line of maps of a number of the cities in and around Boston, and is marketing them by direct mail advertising.

From Hollis Ware: "The other day I met James Tryon [the Institute's former director of admissions], who is a neighbor of mine here in Medford, and he told me that Dick Tryon, II, his son, was in town for two or three days. As I had not seen Dick since graduation, I at once arranged to drop in and have a talk with him. Dick has been married for about ten years, and he and his wife have two boys, Richard, Jr., and David. Dick is connected with the technical service division of the Standard Oil of New Jersey. He warned me that the title of the division is misleading, and suggested that an explanation would be

helpful. As now constituted its work is on the economic justification for improvement in refinery equipment. He makes his home at 250 Canterbury Road, Westfield, N.J. We had a great time comparing notes and explaining our respective jobs to each other. Dr. Tryon was an interested listener and helped to make the visit enjoyable. Dick is an honorary secretary of the M.I.T. Club of Northern New Jersey. He comes to Tech for his company each year, to talk to seniors about jobs.

"By the way, there was a little mistake in a recent issue of our class notes. Your Assistant Secretary's latest acquisition, Anne Charlotte, was his fourth, not third, child."—F. LEROY FOSTER, *General Secretary*, Room 6-202, M.I.T. HOLLIS F. WARE, *Assistant Secretary*, 17 Green Road, Medford, Mass.

## 1926

We nominate for captain of our insurance team, I. Austin Kelly, 3d (remember the Kelly brothers?), who has just been presented with a cup, awarded by the directors of the Phoenix Mutual Life Insurance Company for leading, during the second consecutive year, the entire field force of the company. "This record," it was announced, "is not only for volume of business reported, but it also represents progress and requiring unusual knowledge of the fundamentals and unique ability to serve clients." After leaving Tech, Austin did graduate work at both Harvard and Oxford and was in the building construction business until 1933, which evidently was a mistake in view of his astonishing record in insurance. The first year he went with Phoenix Mutual he placed fifth, the second year he was fourth, and the last two years, as reported, he has been first. That, gentlemen, is a record to shoot at!

Of further interest in the Kelly saga is the fact that Hump Barry, who was also until recently in a firm connected with the building construction industry, has become an associate of Austin's in his White Plains, N.Y., office. He will specialize in life insurance trusts, business insurance, and taxation, coöperating with attorneys, cost accountants, and banks throughout Westchester County and New York. Thus do mining and mechanical engineers, by way of building construction, become prominent insurance men.

Bill Sessions, who is a patent attorney, with Richey and Watts in Cleveland, Ohio, is secretary of the M.I.T. Association of Cleveland.—Horace McM. Bush is with Draper, Williams and Company, members of the New York Stock Exchange, in their Boston office.—Leo Teplow, another one of our patent attorneys, recently had an article on trademarks in the *Allis-Chalmers Electrical Review*, a magazine published by the company for which he works.

The 1938 nuptial parade has begun with one engagement and two weddings in February. The engagement was George W. Breck's to Miss Elizabeth Geer of Manhasset, L.I. The weddings were Herbert T. Creedon's to Miss Anna Murray of Pelham, N.Y., and Francis Walsh's to Miss Frances Connor of Somerville.

1926 Continued

At the Technology Smoker in late February in Boston the following members of the Class were present: Haskell, Ken Billings, Levis, McNeil, Flint Taylor (assistant chairman, Boston Alumni Fund Committee), George Smith, Valentine, Dean, Elton Staples, Wilbur, Bush, Abe White, Rufus Briggs, Killian. The majority of this group met for dinner beforehand, where Elton Staples arranged for the final steps of our Fund Campaign. Elton has done a magnificent job for the Class in the Boston area. Featured at the smoker was a fencing exhibition, of which Joe Levis was the stellar performer, through whose influence it was possible to bring together all but one of the major fencers in the United States. In charge of the smoker was Ken Billings who, together with Flint Taylor, handled the affair in good 1926 style. — J. RHYNE KILLIAN, JR., *General Secretary*, Room 11-203, M.I.T., Cambridge, Mass.

## 1931

The Polytechnic College of Engineering, Oakland, Calif., has announced an important new addition to the faculty in the person of Francis D. Matthews, who has joined the teaching staff as a professor in the mechanical engineering department. — The General Electric officials announced recently that Samuel R. Puffer of Lynn has been appointed designing engineer of the airplane supercharger department of the Lynn General Electric Company. Puffer succeeds Sanford A. Moss (father of Sanford A. Moss, Jr.), known as the father of the airplane supercharger, who retired recently.

C. E. Locke '96 brings us the news of the marriage of G. Hugh Vivian to Miss Joan Lang on December 4. The wedding took place at Sarnia, Looe, Cornwall, England. Another announcement brought to our attention through the columns of the Boston *Globe* is that of the engagement of Miss Janet Porter of Waterbury, Conn., to Lawrence B. Barnard. Larry and Miss Porter will be wed next summer.

Willis Fleisher, Jr., crashes through with the following bit: "I've just been waiting to write until I'd have some real news for the class column. It arrived on the morning of January 16, a son, John, weighing in at six pounds, 15 ounces. We've been living at 7741 Mill Road, Elkins Park, Pa., since September. We bought the house so as to have room for the added attraction. I've been working as assistant general manager for the H-B Instrument Company for the last four years and will be glad to hear from any members of the Class who happen to be in the neighborhood. Saw Bob Leadbetter at a Tech club meeting in Wilmington almost a year ago and sold a thermometer to Leon Kolker, who was starting his own chemical company near New York. Haven't heard or seen anything of any other class members, though I'd like to hear if any of them happen to land in town." — Congratulations to Bill and Mrs. Fleisher on the "real news." Just to see how it would look in print, let's say, Mr. John Fleisher, M.I.T. Class of '58.

Many thanks for your letter, Bill. Maybe it will inspire more of the proud papas of '31 to write. — BENJAMIN W. STEVERMAN, *General Secretary*, 11 Glenland Road, Chestnut Hill, Mass.

## 1933

Yours truly deems it wise to advise you that two months from the day you receive this issue you had better start thinking about packing your bags for our five-year reunion. By this time you have probably received notice of the program. Why not plan to be with us!

We have only one announcement from the society columns this month: the marriage of James Peter Warbasse, Jr., to Miss Gertrude Benjamin. Warbasse attended Sheffield, Tech, and Yale; he received his doctor's degree from Long Island College of Medicine in 1935; following his internship at the Methodist Episcopal Hospital, he is attending the graduate school of medicine at the University of Pennsylvania. — Had a letter the other day from John Longley, who is with the Telephone Company in Albany. He reports that he has been doing a lot of skiing and skating this winter and helping with an evening school in Schenectady.

Mal Mayer, as you probably know, is now in New York. He received a couple of letters from some of the fellows in Course IX, and forwarded a card he received from Paul Gerhard, who is with the E. G. Budd Manufacturing Company in Philadelphia: "Building lightweight trains. No mate to the ship; the crew hasn't been signed on yet." — From W. W. Laird, Jr., of Wilmington, Del. (forwarded by Mal): "Following graduation I took several months off before settling down to work and traveled to the West Coast through South America, through Rio de Janeiro, and another trip touring England in a very ramshackle Willys-Knight. Went to work for the E. I. du Pont de Nemours and Company at the dye works in Deepwater Point, N.J., in January, 1935. Remained there for a little over a year, working on the development of Neoprene, night shift. Ouch! Between times took graduate work at Penn in organic chemistry, which I had not touched on at M.I.T. I am now in Wilmington, still with the Du Pont Company, working at accounting. (In case you don't know about the joys of warming a chair and punching a machine all day, please refer to me. I can give you explicit information.)

"Married a Wilmington girl who was at high school with me. We live just outside of town, in an old house which we reconstructed two years ago. Hobbies: eating and sleeping. Waistline on the increase. Last vacation: to Bermuda, where we nearly froze to death." — Thanks for your notes, Chick and Paul; it surely is good to hear what you have been doing.

A couple of weeks ago I received a change of address notice from the Institute, telling me that Dick Fossett had moved from Cincinnati to Long Beach, Calif., and I was sure there was a story behind it. Here is Dick's answer to my

letter inquiring about his move: "I doubt if my transfer will be of interest to anyone. The former production supervisor for the company here at Long Beach left the company on January 1, and since I happened to be close at hand in the general offices, I was offered the chance to come out and make sunny California my home for a while. Of course I literally jumped at the chance, and so here we are. Procter and Gamble is noted for quick moves for its employees, but I never realized that a move could be quite so fast. We packed up and left Cincinnati on one-day notice. It was a wonderful trip out, though. We drove and had the novel experience of being on the rim of the Grand Canyon on New Year's Eve. This is all new country to me, and we are having the time of our lives sightseeing and marveling at the climate." — Just got this fellow moving east from Kansas City to Cincinnati and now he takes a jump to California; we'll never see him now. However, thanks for your letter, Dick, and let's hear more about your work.

On January 31, Charlie Buchanan died very suddenly from, as I understand, blood poisoning which set in after a face infection. Charlie's death surely came as an extreme shock to some of us here in New York who were his fraternity brothers. I am sure you all join me in extending the Class's sympathy to Charlie's folks.

Now we'll finish the way we began: Don't forget the first week-end in June! — GEORGE HENNING, JR., *General Secretary*, Belmont Smelting and Refining Works, Inc., 330 Belmont Avenue, Brooklyn, N.Y. ROBERT M. KIMBALL, *Assistant Secretary*, Room 3-108, M.I.T., Cambridge, Mass.

## 1934

Although the influx of letters from the members of our Class during the last month has not presented any serious problem to the post office department, I have received a few which I think will be of interest to all of us. Herbert Andrews writes that he is working as assistant to Luis de Florez '11 of the De Florez Engineering Company of consulting engineers in New York. They specialize in aeronautical and petroleum refining problems. From what Herbert says, the job requires constant study to keep up to date on the latest kinks in order to keep one jump ahead of the game. It looks as though Herbert has got something there.

From Brad Ellenwood, Jr., I have received quite a bit of information about some of the members of Course XVII. Frank Cosgrove is working for the Metropolitan Water Commission. Brad says that despite his title of junior engineering aide he is quite evidently running the Quobbin Dam project in Ware, Mass. He is doing concrete sampling and testing, taking samples of earth fill, and keeping cost data as side lines to his executive duties. It looks as though Frank has a dam nice job. Andy Anderson is working on an apartment building in New York for the Turner Construction Company. Joe Fishman is with the Priggen Steel



1934 Continued

Buildings Company in Cambridge, Mass. He is doing design, estimating, construction supervision, detailing and production supervision, and about anything else that requires the ability of a good engineer. I wonder if Joe plays with a Meccano set in his spare time? Jack Platt is working with the Platt Construction Company of Boston. They are responsible for the new theater that has just been finished in West Newton. Bob M. Becker is field superintendent for a contracting firm in Boston. Brad himself is inspector on the construction of the new \$850,000 Wellesley Senior High School. The building is a W.P.A. project, but Brad is employed by the town of Wellesley. Brad wants to know if anyone has heard what has become of Bert Summers, Vin Rother, and Sam Crew. I guess a lot of us would be interested to know; so if anyone has any clues, drop me a line.

In a letter from Frank H. Moore, Jr., he says he is now working on the Pennsylvania Railroad electrification. Of the project that is being carried forward at present, the main line from Paoli to Harrisburg has already been completed and is in revenue service. The Trenton cut-off is being pushed rapidly through to completion. Frank's position seems to be that of righthand man to the general foreman in charge of catenary construction. Last June 19, Frank was married to Miss Elsie P. Eliason, formerly of Middletown, Del. The couple planned a honeymoon in Europe, but two days after the wedding the bride developed appendicitis and had to spend the next few weeks in the hospital for a repair job. However, as soon as the Pennsylvania electrification is completed next spring, Mr. and Mrs. Moore will continue with their postponed trip on the S.S. *Excambion*.

From the Midwest we get the news that George E. Merryweather has been elected treasurer of the M.I.T. Association of Cleveland. This seems to indicate that George is continuing the same active interests in M.I.T. affairs that he showed while he was at Tech. From still farther west we hear that Mr. and Mrs. Frank R. Milliken, Jr., who are in Salt Lake City, Utah, had a visit from the stork on January 15 and were presented with a future Tech man, Frank R. Milliken, 3d.

The following are a few engagements: Roland Boucher has captured the hand of Miss Dorothea Hiltz, daughter of Mr. and Mrs. J. Roy Hiltz of Brookline. The wedding will take place in June. Tubby Thayer is planning to take the fatal step with Miss Eleanor Constantinides, daughter of Dr. and Mrs. Charles L. Constantinides of Rutherford, N.J. Ray Kenney is fixin' to marry Miss Dorothy May Andrews, daughter of Mr. and Mrs. Frank H. Andrews of Watertown.

Radio Hisamoto broke into the news the other day, when he took the competitive examinations for the application as radio operator for the Somerville Police Radio Station, WPEH, and came out top man on the list. Radio has been an amateur for more than ten years and had the distinction of being the first man ever to transmit signals on a wavelength

of ten meters from Honolulu to the eastern part of the United States.

I hope, now that the ice has been broken on this letter-writing situation, you fellows will continue to keep them coming full of news. It is, oh, so easy, once you get down to writing. If you don't believe it, try it and see. — JOHN G. CALLAN, JR., *General Secretary*, 24 Quincy Street, Cambridge, Mass. ROBERT C. BECKER, *Assistant Secretary*, South American Development Company, Apartado 655, Guayaquil, Ecuador, S.A.

## 1935

It is only two months now until Alumni Day. I expect that quite a few of you will be trekking back to the Institute to enjoy the opportunity of dishing it out with some of the boys. During the day the fellows will be pretty widely scattered, so that it seems desirable to have a definite place to meet. After due and weighty consideration, Stocky and I decided to designate the University Club as the place and 5:30 P.M., June 6, as the time. There, we can all partake of certain beverages and swap stories before the Alumni Dinner. It will be on a strictly cash basis — pay for what you want — so those of you who are on the water wagon need have no fears of the expense. Incidentally, if for any reason you do not plan to attend the Alumni Dinner this year, be sure to show up at the University Club anyway to renew old acquaintances. I'll not burden you with any more details of Alumni Day, as they will be published in *The Review* in due course.

The marriage notes seem to be dwindling. Can it be that we are reaching the saturation point? Here is the crop for this time: Fred Travers and Elinor Talbot are engaged. According to my records, Fred is carrying on analyses and tests for the Plymouth Cordage Company in Plymouth, Mass. — Bill Weems and Hazel Rood of Hartford have announced their intentions. Bill received his master's in '35 and is now teaching at the Georgia Tech School of Aeronautics in Atlanta. — Brydon Greene and Virginia Hitchcock were married January 3. Some of you will remember that Brydon was with us the first two years at Tech. He subsequently received his degree at the Yale School of Architecture. — Mort Rosenbaum and Lorraine Schiller were married February 12. My files indicate that Mort is with Consolidated Aircraft Corporation in San Diego. — Next classmate to fall victim to the wiles of the fair sex is Link Paige, who married Kay Taylor of Poughkeepsie last February. Link is with Congoleum-Nairn, Inc., in their sales division. — Jack Ballard reports that Carbon and Mrs. Dubbs have a third member in the family. He also mentioned that Jack Du Ross and Elizabeth Siller were married last June. Phil Johnston, Jack Burton, and Wes Loomis were on hand for the wedding. Jack is working for the Sherwin-Williams Company in Cleveland.

Here are some miscellaneous bits of information about some of the fellows: George Agnew has gone to Lima, Peru, to

work for the Cia de Aviacion Faucett. Julian Bigelow is with the International Business Machines Corporation in Endicott, N.Y. Lloyd Clark is with Snider Packing Corporation in Rochester, N.Y. George Kessler is working at the Municipal Airport in Cleveland for American Airlines. Hart Livingston is now in New York City working for Babcock and Wilcox. Howard Tatel is teaching in the department of physics of Stanford University. John Thorpe has been transferred to Louisville, Ky., by American Telephone and Telegraph Company. Utley Smith is doing time-study work for Johns-Manville in Manville, N.J.

From Stocky we have a bit of news about Dave (— faster) Buckwalter. Buck went to the Southwest a year ago to try to cure a case of sinus trouble. He worked for two months in Galveston on geophysical oil searching. However, the climate there was not all to be desired, so he made tracks for Arizona. As a side line (?) to his traveling about the wonders of the Grand Canyon, and so on, he spent two months working for the Union Oil Company. He then sang his way into the hearts of the powers that be in the American Potash and Chemical Company. He worked as a chemist at their plant just below Death Valley in the middle of the Mojave Desert. He traveled over 5,000 miles on his motorcycle, seeing the desert, mountains, and so on. Seems, though, that he tired of such a dull life, for in November Buck left for Los Angeles to look for a job, only to have the sinus raise Cain again. He returned to El Paso, Texas, where, at last writing, he hoped to get a job with either American Smelting and Refining or El Paso Natural Gas Company. Guess Buck is still there, captivating the adoration of the ladies with his remarkable voice, which he spent two months training while in Los Angeles.

Art Hamilton dropped me a line to give an account of his adventures. Early in 1937 he was working for General Electric in Lynn on the layout of equipment and materials handling equipment for the alternating current motor department. He left there to join the Peter Cailler Kohler Swiss Chocolate Company, Inc., in Fulton, N.Y. The company manufactures all grades of cocoas and coatings, all Nestle products, as well as Runkel, which is a comparatively new product. Art started on the drafting board, doing odd bits of machine design, while learning the ropes. The plant employs 1,200, including 125 in the engineering department. Last summer they started producing their latest big seller, "Puffed Chocolate," and Art was kept on the run, working on the equipment required for production. At the end of October he was given the job of supervising the drafting and the clerks of the engineering office, in addition to all the electrical engineering in the plant. "What a blow to a dyed-in-the-wool mechanical engineer," to quote from Art's letter. A short time ago he was placed in charge of engineering information to be passed on to the supervisors and was relieved of the supervisory duties. At the same time he has been reor-

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ganizing all the office records, tracings, blueprints, catalogues, and so on, so that they may be found readily.

Art had the following news to offer about others in the Class: Ben Beede is with the Foxboro Company in Minnesota and Wisconsin, with the title of expert on controllers and recorders for paper mills. Bob Lindenmeyr is still with Westinghouse X-Ray on Long Island. Charlie Rynd is with the National Broadcasting Company at Radio City. Rad Edmonds is still with Union Carbide and Carbon in Charleston, W. Va. Art is hoping that Jim Eng will drop in to see him soon. Take notice, Jim.

Here is one of those amusing epistles from Jim Casale: "Everything in this world seems to have some regular sequence, some rhythm. Praise be the Lord! The angle of refraction is equal to the angle of incidence! Or something like that. Everything, including alumni contributions and class notes. Class notes are a function of people; people are a function of the world; and the world is a function of I-don't-know-what, except that to me it is a constant. I imagine that if you study the class notes of any number of alumni magazines, you will find invariably that the youngest class is the most prolific and exuberant contributor, the second is still enthusiastic but starting to sober, the third makes almost no response. As you continue down the line, the graduates are becoming mature, prosperous, income-tax grippers, anti-New Dealers, and it shows up in the class notes. Finally, at the end you will find an account of a trip around the world, descriptions of hobbies, obituary notices, and remarks about children and grandchildren. The fact is that a fellow could develop a good thesis on the trends and cycles of class notes. Will I be embarrassed if an early issue produces a sweeping avalanche of news about the Class." Good Lord, is this fellow Casale writing an advance obituary for the class notes, or is Jim slightly whackey in the upper regions? Let's see what you fellows can do to make Jim pull in his neck.

To continue with Jim's story: "I used to be happy in my self-appointed station as your Western correspondent. But now Chosen, which is Japan, which is near Manchukuo, which is near U.S.S.R., is my place, and what can I report? You don't need a Western agent, anyhow. Take Montana — poor, persecuted Montana. What a bunch of bums from M.I.T. up there now! They'll own the state in a couple of years. Lane will be governor; Porter and Stratton, senators; Clark, political boss; Price, mayor of Butte; and Graham, general bulwark (bull-work) of the state. My present job is in the metallurgical department of the Oriental Consolidated Mining Company, an American concern operating on a large concession in northern Korea, granted to them by the last Korean emperor. O.C.M. Co. has three substantial gold mines and a host of small tribute mines, some of them very rich. Production for 1937 will be over two millions of dollars of gold. As long as the Russians and the Japanese keep their

peace, I imagine I'll remain here. But if things break, perhaps I'll try to muscle in on that bunch of racketeers in Montana or try the Philippines."

Last letter of the month is from Jack Ballard. Here is his story: "I was with the Reliance Electric and Engineering Company (in Cleveland, except for brief sojourns in Detroit and Pittsburgh) from 1935 until the past December. Still with Reliance are Harry Essley '36 in Cleveland and El Koontz '36 in Philadelphia. While there I helped sell and later, in a production way, helped make electric motors. Last December, I came to Milwaukee to work for a company called Globe-Union, Inc., in their production department, though I'm still very much of a learner here. We make a number of different things, mainly storage batteries, roller skates, and spark plugs; also, switches, variable resistors and fixed resistors for radios. An interesting plant with highly motion-studied, conveyORIZED assembly operations and Rube Goldberg automatic machinery, which is new to me. Milwaukee is a fine town, even for a stranger. The nickel beer is the rule, and we're close enough to the North Pole not to be too warm in winter. Personally, I'm neither married nor a very good prospect.

"Several '35's passed through Cleveland last year on various errands. Bart Chapman came by. He was still with Remington Arms in Bridgeport and was on a tour of various Du Pont plants, studying production control. Another was John Duff. He came to Cleveland to learn about Iron Fireman stokers, which we made there and which he sells in New Bedford. Still another was Jack Burton. Jack was just doing a little vacationing after finishing at Harvard Business School last year. Last November, on the way to New Orleans and Florida (boast), I just missed Art King in Louisville. He's still a debit-and-credit man for the Mengel Company there.

"A little birdie (hope he doesn't mind being called that) tells me that Bill Cross, Bob Henry '34, and George Wemple '37 are operating a bachelor establishment at Tudor City in New York. Borden Brownell is with the Electromotive Corporation in LaGrange, Ill. It's a new plant, to build Diesels and streamline trains. He has done a lot of work in designing and setting up a test floor for them. Eric Jones was in Pittsburgh, selling bonds, when I was there last spring. He went to Philadelphia at that time to work for the Brown Instrument Company. His boss in Philadelphia, incidentally, was Dick Hawkins, who graduated from the Institute ten or so years ago. And a note on a '36 who was once a '35: Had a card from Clarence Horton. It was from Heidelberg, Germany, where his job with Dravo Corporation of Pittsburgh had taken him." — Many thanks to you, Jack, and to the other contributors to this column. We need more news to show Jim Casale that his analysis is screwy.

So far there have been only about 130 contributors to the Alumni Fund from the Class. I'm sure there is not one of you who cannot contribute at least some small

amount to this fund, which we all agree is for a very worthy purpose. Better get out your checkbook now and do your bit. Let's put the Class out in front. — ROBERT J. GRANBERG, *General Secretary*, McCulloch B-13, Soldiers Field, Boston, Mass. RICHARD LAWRENCE, *Assistant Secretary*, 111 Waban Hill Road North, Chestnut Hill, Mass.

## 1936

With great pleasure we announce the birth of another heir to the fortunes of the Class. On January 20, David Niles Parker arrived at the home of Mr. and Mrs. Franklin P. Parker. Of course, the son will soon be at M.I.T. in the Class of 1959. Of late, Frank has been working with the engineers on the Pinnacles project, Meadows of Dan, Va.

*Course I.* A letter from Henry Mabie tells of his work with the Boston and Albany Railroad and also of his previous work for the commonwealth of Massachusetts: "The report that I am 'making surveys on equipment and reports on ways to save money for the company' is the result of a tale which grew in the telling. Shortly after starting work for the railroad, I discovered a mistake in the area of some real estate which was being sold. If the error had remained undetected, the company would have lost about \$200; so, in a way, I saved money for the company. . . . Actually I am a draftsman, and practically all my work consists of designs for new bridges and repairs on old bridges. I do all the computation and drafting on most of these jobs. . . . Owing to the fact that I follow each job through from the inspection of the old bridge to the structural details of the new one, I find the work very interesting and very good experience. . . . The previous job with the commonwealth of Massachusetts was rather interesting, too. The first few weeks were rather unpleasant, I thought, as I was employed as a sanitary inspector searching out sources of pollution in the Metropolitan water supply. After that I was given the job of making aerial photograph mosaics: fitting together individual photographs to make a map. This was very interesting work and had one interesting by-product: From the trimmings I got enough overlapping three-inch squares of photograph to make quite a lot of stereoscopic views which stand out beautifully, showing the contour of the ground in very high relief."

Henry says that he has seen Weaver and that he is working at the Institute. From Elliott Robinson I hear that Bill Prudente was still unemployed when last encountered. Elliott says that his teaching at evening school finished the end of March but that tutoring still keeps him busy. He has changed his address in Brockton to 48 North Pearl Street.

*Course VI.* Nick Leftes has forwarded the following letter from Roman I. Ulans: "I am still with the Consolidated Edison Company of New York and am being kept busy at their Waterside generating station. I feel it is excellent experience because when the station is modernized,



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it will be one of the most efficient in the world. The equipment being installed is the very latest. The generators are hydrogen cooled, and the turbines receive steam at 1,200 pounds per square inch and 900 degrees F. I could go on like that for pages. Perhaps the most important event for me these last few months was the announcement of my engagement to Morwenna C. Tellier. She is a graduate of Emerson College in Boston and at present lives in Westerly, R.I.

*Course VIII.* Good news about a member of this group has been forwarded by Charlie Evans, who says: "Carl White was married on December 24. Welcome to the ranks, Carl, and congratulations! There was a serious error in the newspaper accounts of the wedding, which should be pointed out. To quote from one of Carl's letters: 'After all the work we went to, to become known as physicists, darned if the papers don't go and publish that Miss Elizabeth Miller, research assistant at the American Optical Company, was married to Carl B. White, electrical engineer . . . in the chapel of the Unitarian Church at Weston, Mass. So I'm an engineer, it seems, whether I like it or not.' Apparently that was the only unhappy incident, however, because the rest of the letter is very cheerful in tone. They drove to Florida and stayed for a while where Carl's folks are and then stopped at Elizabeth's home in Hagerstown, Md., on their way back. The bride and bridegroom now reside in an apartment at 20 Elm Street, Southbridge, Mass. Besides getting married, Carl has been keeping at work on the numerous (other) projects he has under way. His latest was a talk on radio antenna systems, which he gave to the local radio club. With that out of the way he's adding photography to his list of activities, so if any of the rest of you have been bitten by the bug, you'd better get in touch with him. From all the rest of the fellows, there just isn't any news this time. As for myself, I'm banging away at the same old job and liking it better and better. Let's hear from some of you other fellows once in a while."

*Course IX.* Our numerous pleas for letters have at last borne fruit in a letter from Charlie Parce, 1343 North Citrus Street, Hollywood, Calif.: ". . . After graduation I returned to the Pacific Coast. . . . I soon found myself in Hollywood, where I became connected with the Technicolor Motion Pictures Corporation. My work deals with many phases of the somewhat complicated process, so that it permits no chance for monotony, as no two jobs that I tackle are exactly the same. I have been very busy for some time now, and expect to be more so soon. Four features have just entered the release print stage, with two more coming along very soon. Turning out the release prints for these features — about 2,250 miles of film — will occupy us until the end of May, along with the many cartoons and short subjects. Tech men of the Class of 1936 seem to be scarce in this part of the country, as I have yet to run across one. Should any be out here, I should like to

get in touch with them." — The only other Course IX man we have heard about recently is Tom Johnson, Jr., who is with the Nash Engineering Company in South Norwalk, Conn.

*Course X.* Right in the thick of recent events (and bullets) in China has been L. Sheo, who went back to China after graduation and was employed by the Yungli Chemical Industries, Ltd., in Nanking. When Nanking was threatened by Japanese invasion in early December, he evacuated with the rest of the staff to Hankow. On December 8, he was ordered to return to Nanking, together with eight other people, to obtain portions of the company property left there. Unable to reach the plant because of the war conditions and unable to return to Hankow, he finally reached Shanghai after spending two weeks on a river boat on the Yangtze, during which there was constant danger from Japanese shellfire. It was during this same period that the gunboat *Panay* was bombed farther up the river, and Sheo considers it almost a miracle that he came out unhurt. An account of some of his adventures has been sent to us by Tehching Li, a friend of his at M.I.T. The following extracts from Sheo's report tell about some of his experiences: "December 10 . . . Arrived at Nanking safety zone. . . . No communications with shore. Shiakwan (section of Nanking along the water front) could be seen in blaze and several other places likewise. Gunfire could be heard clearly and it ran the whole night through.

"December 11. No vessel was allowed to proceed beyond the Riverside power plant in Shiakwan. Neither was the telephone in operation. Sampans could be secured to go ashore, but was assured by the sampan men that there was no way to go to Shiakwan, which had been very badly burned for the last few days. Shiakwan was still in Chinese hands, but strict marshal law was enforced. Pukow was reported badly bombed yesterday; the railroad and the station suffered the worst damage. Walking to the Yungli plant on the Pukow side was deemed not possible because retreating soldiers were everywhere, and law and order was not maintained. Saw two steamers loaded with refugees cross to Pukow from Shiakwan, and ten minutes later several bombs were dropped from the air. . . . Seeing that there was no possible way to get to the plant, we decided to return to Hankow immediately. Going back by train from Pukow was investigated and found very uncertain. After several hours of anxious waiting, we were able to find S.S. *Tseang-tah*, which was scheduled for Hankow in a day or two. Shortly after we boarded, the ship was subjected to heavy shellfire. . . . One shell fell only 40 feet from where I was. A total of about 50 shells were fired. . . . Slept on deck.

"December 12 . . . Our boat left Nanking at 2:30 A.M. and arrived at Wuhu at 7:00 A.M. Here it was learned that Wuhu was already in Japanese hands. . . . At 7:20 A.M. machine-gun shots were fired from shore for about five minutes. Several bullets were later picked

up on our deck. One bullet went through the pilot's room where the captain was piloting. Luckily, not a single one was hurt. Everyone was tuned up to a high pitch of excitement and right on top of that, at 8:30 A.M., came suddenly very heavy shellfire from the shore, which is only half a mile from the ship. Our ship was the first to run, keeping close to the shore so that the ship was under cover of the high bank of the river. The worst the shells could do was to hit our mast. Shells dropped everywhere; it was a miracle that we remained unhit. . . . Several passengers left the ship to go on the northern shore. Wuhu was on fire, and smoke and fire displayed a remarkable sight that left a permanent memory. Slept on deck again.

"December 13. Got up early, eager to find what was in store for us. H.M.S. *Bee* passed . . . and informed us that the American gunboat *Panay* had been sunk . . . yesterday afternoon, and she was going down to the scene to do whatever she could for the wounded. More people left the ship. Our position had been given to the Japanese authorities on land and was considered safe as long as we remained still. Any movement might cause further shelling. . . . Many of our staff wanted to go ashore on the northern side, but I managed to make them stay on board because I was not sure of the conditions ashore. Robbery was reported. As long as we stayed on board, we were safe. But we might stay here for an indefinite length of time. . . . Food was good but could not last long.

"December 14. More left the ship. The unrest among our staff grew worse. . . . Three Japanese planes flew overhead, causing more fear to our staff, who finally decided, against my will, to go ashore. All eight of them went, taking only small bundles. . . . The ship might go to Shanghai instead of Hankow; anyhow I would remain on board. Caught a severe cold sleeping on the deck." After five more miserable days on the river, Sheo finally arrived safely in Shanghai. Whew! Some experience!

Some time ago, the postman delivered a veritable package for me, which turned out to be a nine-page letter from none other than El Koontz, our Course Secretary in the Quaker City. Since El hopes to make this tome his masterpiece for the year, he has requested that it be run as a serial in the class notes. I'll reproduce as much as my calloused index fingers and worn portable will allow this month (not to mention The Review Editors and the necessity of confining the notes to a reasonable length), and next month the story will be concluded. Speaking of the Editors reminds me of an item that was cut from last month's notes, to the effect that Louis Smith has been transferred from Carbide and Carbon Chemicals in South Charleston, W.Va., to the patent department of the parent corporation in New York City. Now to proceed in Koontz's inimitable style. For his first news he takes us back to the football days of last fall: "As a start, you might be interested in hearing about the minor

## 1936 Continued

Tech '36 reunion we had here in Philadelphia the week-end of the Army-Navy game. Naturally, since it was practically necessary to kiss an admiral to even get tickets for the game, it wasn't possible for our whole crowd to get seats together, and we sat more or less individually (among 107,000 other people) through the downpour. After the game, however, we proceeded to my apartment for a little drying off party, and our crowd was seen to consist of, together with respective dates, Gordon Thomas, Nate Ayer, Harry Essley, Jack Kleinhans, Don Brown, and E. H. K. Harry had come on from Cleveland for the week-end, and although we didn't have much of a chance to talk shop, he told me a little about his work in the standards department at Reliance (in case you've forgotten, we work for the same stockholders). Gordon had come down from Milford, N.J., where he and Towers Doggett are still making paper for Riegel, and Nate had come down from York, Pa., where he and Carl Peterson are setting rates for the manufacture of those famous York air-conditioning units. Jack Kleinhans you'll probably remember as a former '36 man who transferred to Lehigh after his first year, and is now making good as assistant plant engineer with the J. T. Baker Chemical Company of Phillipsburg, N.J. You probably also remember Don Brown, who was with us our freshman year at Tech. He's now a first classman at Annapolis and company commander at that. All of which puts him in the position of being the guy to get kissed in front of all the newsreel cameras next spring, if his company wins the annual competition. (Which they probably will, with Don as commander.) It was a splendid reunion for all of us and really like old-home week to see so many familiar faces again.

"To get on with the news. Bill du Pont writes from Richmond, Va., that he's risen to the job of foreman of the spinning room and is now entitled, on occasion, to wear a reasonably light-colored collar. Willy, you know, is with Du Pont Rayon, and has apparently been keeping his nose so close to the grindstone that he hasn't yet taken the first vacation he's entitled to. It appears that quite a sizeable Tech colony is growing up around Richmond. Willy reports that Pete du Pont '33 and Norm Copeland are both there with Du

Pont as industrial engineers; while Ledyard Blakeman (and his wife Virginia Davidson '34) is with the city engineering department. . . . Bud Rust's wedding there [Richmond] last spring brought out Hal Bemis, Jack Gardiner, Charlie Taylor, Proctor Wetherill '34, Gus Gorham, to mention only a few of the Tech names of recent vintage. — Let's make a quick jump from the Atlantic Coast to the Pacific. Roman Ortynsky, who hadn't been heard from previously, turns up in Berkeley, Calif., with some news about himself we've all been waiting to hear: 'You probably know that I didn't graduate with the Class because of an automobile accident in March, 1936, which resulted in a broken femur. I recovered quickly enough to return to Tech in September, 1936, and took some graduate work in X-A, but before the term was up, I was in another accident which produced a cracked pelvic bone. So there and then, I decided I'd take X-B instead and get out of Boston before they really got me. So I finally graduated in 1937 and landed a job with the Shell Development Company.' Ro writes that after a period of routine analytical work, he is now in the manufacturing research department, working particularly on asphalt. Ro doesn't seem particularly impressed with the Californian climate and hopes to land eventually back in Pennsylvania. For the present, however, he has three companions in exile — Harry Sommer, Kerry Arabian, and Phil Short, all '37.

"George Hain turns up as another budding oil man. He's with Socony-Vacuum Oil Company in Brooklyn and is in the products development department, where he formulates new products in the laboratory and then tries them out on a semi-plant scale. George achieved the distinction at Tech of being one of the first lads to haunt the Institute with a candid camera, and he's still at his hobby. He says it was a relief to spend his vacation taking pictures instead of using three and a half hours a day to commute between Brooklyn and his home in Montclair, N.J., as he does all the rest of the year.

. . . John Eberhardt writes from Lackawanna, N.Y., that he's still acting in the capacity of the director of the M.I.T. Practice School at Bethlehem Steel, and that he has no marital history or aspirations to reveal here to the public. Doc

claims his job should be rated a position and then proceeds to fill a whole sheet of paper in answer to my question, 'Are you an engineer still or yet?' by giving a highly irrelevant but amusing treatise on the words 'still' and 'yet' with the aid of Mr. Webster's dictionary. The next letter that comes to hand is from Pyam Williams. He writes that he's still with Ohio Boxboard Company and that although he doesn't rate a position, at least holds down the job of assistant to a man who has a position. As assistant chief power plant engineer, he's responsible for boiler water conditioning, although he admits he can't remember just which course at Tech was supposed to 'larn' him that subject. In case you've forgotten, Py is a Mainiac, or Mainite, or, anyhow, a loyal son of Maine, and he claims it was like heaven to spend his last vacation there again. Incidentally, Py claims to be shooting for the record of class bachelor, so that there will be someone left to get drunk at alumni reunions, but I've heard that one before." Pausing with that note on alumni reunions, we'll leave the remaining five pages of El's letter for next month. By the way, we do have a reunion scheduled for June 6!

*Course XIII.* A brief note has arrived from our correspondent for this group, Art Wells, who says: "I was glad recently to hear of Bill Ramsay's whereabouts. He is connected with Gibbs and Cox in New York City, where he is working on electrical designs for naval destroyers. Until recently Bill and his wife have been living in Haworth, N.J., but, deciding against the commuter's life, they are now living at the Hotel Empire at Broadway and 63d Street in the City. Being a commuter myself, I can understand Bill's move. Al Hardman, having finished up his thesis and a few odds and ends at school this midyear, is back in New York City. He is returning to Moore and McCormack Steamship Company, where he worked the greater part of last year, and is being placed in their engineering department."

And so we conclude our offering for this month. In closing I wish to call attention to my new address given below. — ANTON E. HITTLE, *General Secretary*, 491 Ashland Avenue, Buffalo, N.Y. ALLEN W. HORTON, JR., *Assistant Secretary*, Room 3-210, M.I.T., Cambridge, Mass.

## You Are Invited

. . . to come back to Tech for Alumni Day on Monday, June 6. You will see old friends and a new Technology. You will be stimulated and entertained. You will experience again the bracing New England spring, the warmth of the Technology spirit, the pride in being a Technology man.

*June 6 is the date!*



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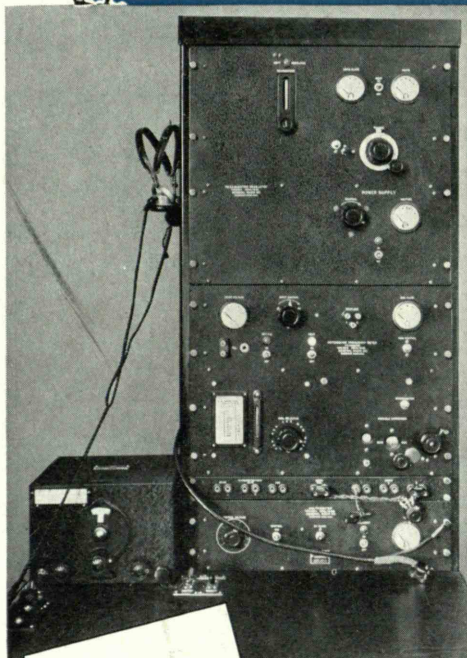
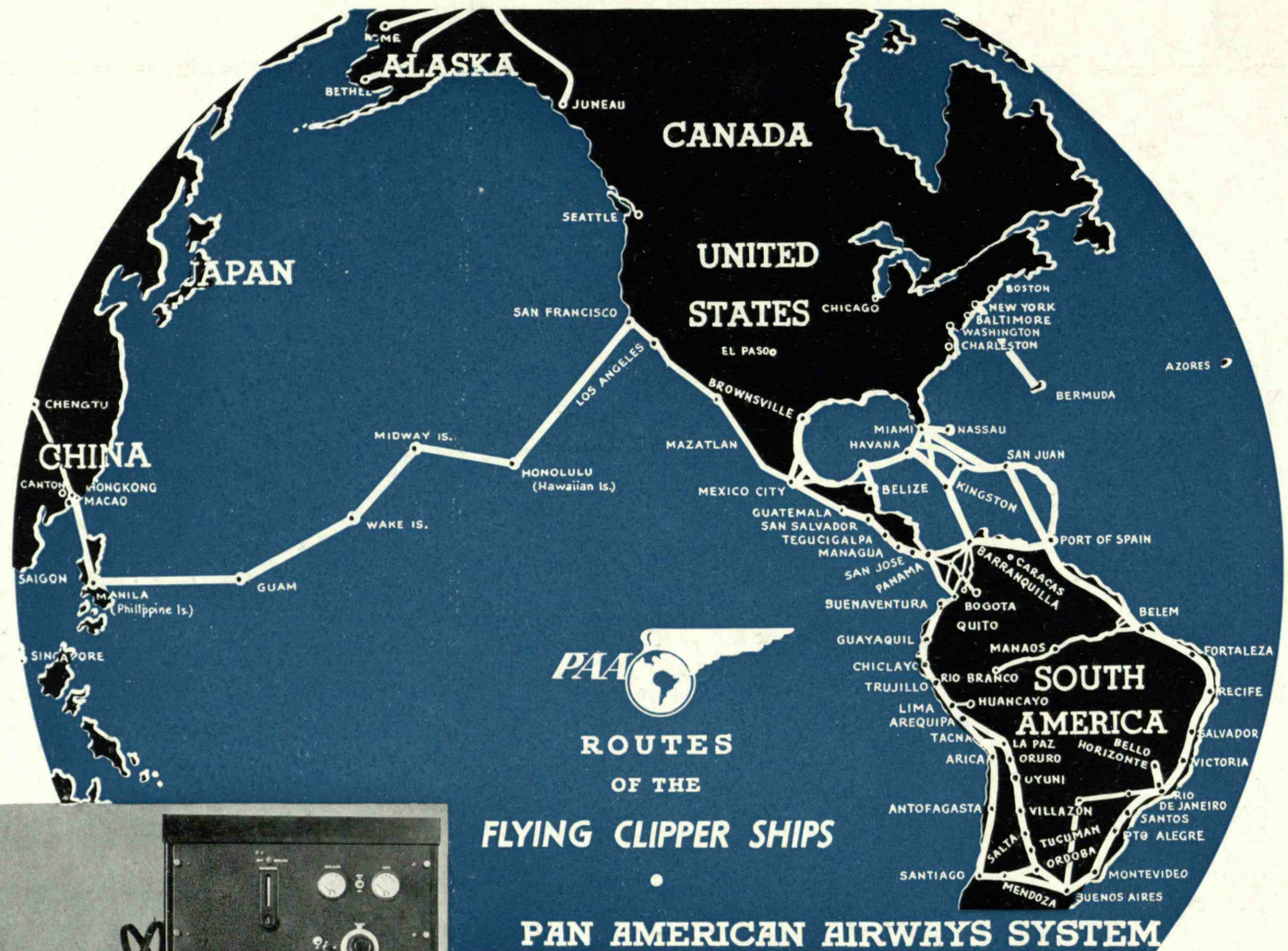
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